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Bulletin of the

British Ornithologists' Club



MEETINGS are held in the **Sherfield Building of Imperial College**, South Kensington, London, SW7. The nearest Tube station is at South Kensington, and car parking facilities are available; a map of the area will be sent to members, on request. The cash bar is open from **6.15 pm**, and a buffet supper, of two courses followed by coffee, is served at **7.00 pm**. (A vegetarian menu can be arranged if ordered at the time of booking). Dinner charges were increased from £15.00 to **£16.00**, as from 29 February. Informal talks are given on completion, commencing at about 8.00 pm.

FORTHCOMING MEETINGS

4 April - Errol Fuller on "*Extinct Birds*". Errol is internationally known as a painter of sporting subjects, with a special interest in the curiosities of natural history, especially in birds. He has published and illustrated several books, including *Extinct Birds* (1987) and *The Lost Birds of Paradise* (1995). His obsession with vanished species has led him to travel the world, researching the records and last remains of the Great Auk, which resulted in the recent publication (November 1999) of a popular edition of his most recent major work, *The Great Auk*.

Applications to the Hon. Secretary by 21 March please.

Tuesday 2 May. ANNUAL GENERAL MEETING AT 6.p.m., followed by a **Club Social Evening**. There will be no speaker, but Members are invited to bring along one or two slides (or a specimen!) of a bird of topical interest, and to speak **for not more than 5-10 minutes** about it. The aim will be to generate discussion, and to facilitate the exchange of information between Members.

Applications to the Hon. Secretary by 20 April, please, including subjects to be raised, and any special facilities required.

Tuesday 4 July - Dr Lincoln Fishpool on "Important Bird Areas in Africa" Dr Fishpool started his professional life as an entomologist, working extensively in various parts of West and East Africa. During the course of this time a minor interest in African ornithology developed into a more serious obsession. In consequence, he changed career and for the past six years has worked for Birdlife International as coordinator of its Important Bird Areas in Africa programme. A book documenting these sites is due for publication later this year.

Applications to the Hon. Secretary by 20 June, please.

Tel/FAX: 01730-825280 for late bookings and cancellations.

Advance notice of meeting dates for the year 2000.

3 October Julian Hume "*A window into the past - the diversity of fossil records on islands*"
31 October Bob Cheke "*Aspects of Sunbird Biology*"
28 November Dr Derek Pomeroy "*The Uganda Atlas*"

Overseas Members visiting Britain are especially welcome at these meetings, and the Hon. Secretary would be very pleased to hear from anyone who can offer to talk to the Club on these dates, giving as much advance notice as possible - please contact: Michael Casement, Dene Cottage, West Harting, Petersfield, Hants. GU31 5PA. UK. Tel/FAX: 01730-825280 (or **Email: mbcasement@aol.com**).

Bulletin of the BRITISH ORNITHOLOGISTS' CLUB

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CLUB NOTES

The eight hundred and eighty eighth meeting of the Club was held on Tuesday 12 October 1999, at 6.15pm. 24 Members and 13 guests attended.

After dinner, Professor Steven Piper gave an illustrated talk entitled *Long-term studies of birds in southern Africa*. He began with a short review of ornithological studies in southern Africa: since the second World War there have been three Directors of the Sir Percy Fitzpatrick Institute of Africa Ornithology (PFAO, also called the "Fitztute"!) at the University of Cape Town and each has left his own personal stamp on both the PFAO and ornithological studies in the sub-continent. Under Jack Winterbottom the emphasis was on studies of the distribution of species and their biogeography. When Roy Siegfried took over there was a sharp change in direction to the hypothesis-testing approach in which birds were seen as useful and convenient objects upon which to test biological ideas. Consequently, general purpose ringing declined and less emphasis was put on single-species studies. The third Director of the PFAO Morne du Pessis, a former student of Roy Siegfried, was appointed in the mid-1990s and he is a student of the individual bird and a strong supporter of long-term, single-species studies.

An excellent summary of the status of our current knowledge of all the species in southern Africa may be found in the recent *Atlas of Southern African Birds* (SABAP, Harrison *et al.* 1997). The text in SABAP contains a brief review of our knowledge of each species and provides an entrée to the relevant literature, on which this talk is based.

The work of the Vulture Study Group and the 50-year study of the Cape Griffon, the first species ever to be ringed in southern Africa in 1948, has produced results important to our understanding of large vultures and to their conservation.

Steven summarised the range of long-term studies including flufftails, robins, gulls, a gannet, a penguin, cormorants, and a wood-hoopoe, and gave an overview of the Longtailed Wagtail study, now in its 24th year, with special emphasis on the differences in life-history which could have been revealed from a long-term study.

The eight hundred and eighty ninth meeting of the Club was held on Tuesday 30 November 1999, at 6.15pm. 24 Members and 10 guests attended.

After dinner, the Chairman paid tribute to all concerned with the planning and administration of the recent highly successful BOU Autumn Conference *Why Museums Matter: avian archives in an age of extinction*, hosted jointly with the Natural History Museum (Tring), British Ornithologists' Club and BirdLife International at Aston Clinton 12-14 November. In particular, he thanked Steve Dudley and Gwen Bonham, Administration staff of the Union, and Robert Prŷs-Jones and his staff at Tring, for a splendidly organised event, greatly enjoyed by all those present. The Club looked forward to assisting with the publication of the *Proceedings* of this conference.

Richard French then entertained the meeting with a splendid talk entitled *Dickcissels in Trinidad*. This was the result of a study made during the years 1959 - 1966, when he was resident on the island of Trinidad, and the following is a brief synopsis:

Very little was known at that time about the wintering habits of the Dickcissel, a North American bunting, and the occurrence of the species on Trinidad was irregular and evidence conflicting. On its

breeding grounds there had also been a history of irregular distribution, but since c.1950 it has bred mainly in mid-western states.

Migration south follows a route via the Gulf States and Central America to Panama and Colombia, thence to the main wintering territory in Venezuela. It seems that some birds occasionally continue on from late December to Trinidad, where they winter in wetlands, especially near rice-growing areas, feeding largely on rice and grass seeds. This study concentrated on a population wintering in SW Trinidad. During the day, small flocks fed in the wetland and rested in daytime roosts in tall grass and bush. In the evening, larger flocks were formed and moved to a traditional roost site, possibly containing up to a million birds, in sugar-cane fields c. 5 km away. Halfway through the study a new roost was selected c. 24 km away from the feeding area, and the birds formed an enormous flock to travel this distance each day. Although the arrival at the roost was sometimes staggered in the evening, departure in the morning tended to be in one mass movement, providing some spectacular sights. At the end of the season birds spent longer days in the field and at night there was usually a period of "nocturnal unrest" before settling down. Departure on migration was observed about 40 minutes after sunset, the birds leaving in small, silent groups. The birds began to depart about mid-April, the males leaving about a week before the females, and all were gone by the end of April.

Of c. 3,000 birds mist-netted and ringed in the roost, there were no recoveries and only two birds were re-trapped. Trapped birds indicated that males outnumbered females by about 2:1. Immatures were moulting into adult plumage by mid-February. Males had wings 10% larger than females, and were heavier by 15%. Average body mass stayed constant till mid-March, then increased by up to 30% as spring migration approached.

Soon after the study was concluded, the Dickcissels ceased their visits to Trinidad - none were observed from 1973 to 1985. There has been some resumption during the 1990s, but on a smaller scale. The likely cause of irruption into Trinidad may be periods of severe drought in Venezuela. Rice-growing has recently increased on Trinidad, with several areas involving larger plantation units. However, the world population of Dickcissels has now decreased by at least 40%.

ANNUAL GENERAL MEETING

The Annual General Meeting of the British Ornithologist's Club will be held in the Ante-room of the Sherfield Building, Imperial College, London SW7 at 6.00pm on Tuesday 2 May 2000.

AGENDA

1. Minutes of the 1999 Annual General Meeting (see *Bull. Brit. Orn. Cl.* 119 (3): 138-140).
2. Chairman's report.
3. Report of the Committee, and Accounts for 1999 (both to be distributed at the meeting).
4. The *Bulletin*.
5. The election of Officers. The Committee proposes that:
 - (i) Mr D.J. Montier be re-elected as Honorary Treasurer,
 - (ii) Commander M.B. Casement, OBE, RN, be re-elected Hon. Secretary.
6. Any other business of which notice shall have been given in accordance with Rule (12).

NOTIFICATION OF CONFERENCE AND REQUEST FOR PAPERS

“DERBY DAYS”: The XIIIth Earl of Derby &
other natural historians of the early 19th century.

The XIIIth Earl of Derby (1775-1851), whose father founded the Derby and Oaks horse races, enlarged on this family interest in livestock and became one of the most famous natural historians of the period. His menagerie and aviary at Knowsley Hall, near Liverpool, was noted throughout the scientific world; he is credited with the first captive breeding of the Passenger Pigeon (which did so well at Knowsley that the birds became a nuisance!) and for such rare species as the Hawaiian Goose. Lord Derby also assembled one of the best private zoological museums in the world, a result of acquisitions from a network of collectors and colleagues worldwide. Birds were Lord Derby's main passion, and he possessed many types and specimens of species that are now extinct or rare. He knew, and corresponded with, all the luminaries of the time – Audubon, Latham, Swainson, Hooker, Owen, Gray, Gould and Jardine – and as a side-line commissioned, or acquired, some of the best examples of zoological and botanical art of the time. Georg Dionysius Ehret, John Abbot, Sarah Stone, Joseph Wolf, John Gould and Thomas Lewin are amongst the artists represented, but perhaps the best-known was Edward Lear, who was Tutor at Knowsley.

The XIIIth Earl bequeathed his collection of birds and mammals to the people of Liverpool. On his death in 1851 this unique collection founded the Liverpool Museum, and the excellence of his foundation gift contributed to the fact that Liverpool's museum service was awarded national status in 1986, becoming the National Museums & Galleries on Merseyside. 2001 will be the 150th anniversary of Lord Derby's original bequest, an event which is being marked by NMGM with a major temporary exhibition on the XIIIth Earl. This will reunite many of Lord Derby's specimens with the pictures for which they were models; many of the latter are still at Knowsley Hall.

A linked conference will be held at Liverpool University Halls of Residence (appropriately in Derby and Rathbone Hall) from 6 – 9 September 2001. The conference will include private visits to Knowsley Hall and to the XIIIth Earl of Derby exhibition at the Liverpool Museum. There will be two days of papers, on topics related to the XIIIth Earl, his network of acquaintances and his wide range of interests. The conference is convened by NMGM, the British Ornithologists' Union, the British Ornithologists' Club and by the Society for the History of Natural History.

Those interested in presenting a paper or poster at the conference are requested to write, with details, to:

Dr Clemency Fisher, Curator of Birds and Mammals, Dept. Zoology,
Liverpool Museum, William Brown Street, Liverpool L3 8EN, UK;
clemf@nmgmzoo2.demon.co.uk.

EDITORIAL

In a wide ranging review of the structure of the *Bulletin*, the Publications sub-committee was charged with investigating ways of reducing costs. We invited tenders from a number of printers, and have decided to move the *Bulletin* to Crowes in Norwich. At the same time, we are slightly changing the format of the journal to the more standard A5, and in future papers will be presented to the printers in electronic format.

I look forward to this new venture and hope that Members and Subscribers will appreciate the changes that will be apparent in this issue. I should also like to take the opportunity of thanking our former printers, Henry Ling Ltd, of Dorchester, for the excellent work that they have undertaken for us. In particular I should like to thank Frank Hemmings for ensuring that our demands were always met, despite pressures imposed by me to introduce changes, or even new papers, at the last minute.

Chris Feare

BOOKS RECEIVED

Marshall, J. T. 1999. *Ornithological tracts on taxonomy and distribution*. Pp. 91, 4 colour plates. Privately printed in edition of 50 copies. Obtainable free from the author at P.O. Box 30890, Alexandria, Virginia 22310, U.S.A. or at jtmvz@juno.com

This curious publication comprises 11 diverse papers and notes by J. T. Marshall and, in two cases, R. B. Clapp, nine of which are on birds, one on mammals and one on botany. Bird species discussed include a variety of owls, Black-capped Vireo *Vireo atricapillus*, Botteri's Sparrow *Aimophila botterii*, Anna's Hummingbird *Calypte anna* and Common Yellowthroat *Geothlypis trichas*. Although containing some useful natural history information, the main purpose of private publication would appear to have been an unwillingness to accept the discipline of peer review.

Robert Prŷs-Jones

Barreiro, J. & Pérez del Val, J. 1998. *Catálogo de las colecciones de aves del Museo Nacional de Ciencias Naturales. Aves no Passeriformes: pieles de estudio*. Manuales Técnicos de Museología, Vol. 7, Consejo Superior de Investigaciones Científicas, Madrid. ISBN 84-00-07780-6. No price given.

Few museums have published catalogues of their collections. This important volume details the 7479 study skins, of 1173 species of non-passerine, in the Museo Nacional de Ciencias Naturales, Madrid. The authors have undertaken detailed investigations of archives, unpublished expedition reports, museum acquisition registers etc. to confirm or correct data on specimen labels and the resulting catalogue includes verified data for each specimen. These comprise: Museum specimen number, sex, age, date of collection, location (continent, country as defined in the 1997 edition of the *Times atlas of the world*, province and locality; the last is described by name rather than geographical co-ordinates, and the authors emphasise that this information is more precise for Spain than elsewhere), and collector or source of the specimen. Taxonomic treatment follows that of Howard & Moore (1991).

The geographical origins of specimens reflects Spain's colonial history, with good representation from Colombia, Ecuador, Morocco, Equatorial Guinea and the Philippines, and of course from Spain itself. The authors remark that the bird collection in the MNCN is the largest in Spain and houses c. 3,000 species (including passerines). This book is clearly an important source of information for those wishing to locate specimens and fulfils one of the needs for exchange of information identified at the recent BOC/BOU/NHM/BirdLife conference *Why museums matter*.

Chris Feare

OBITUARY

**Ronald Edmund Fraser Peal
(1917–1999)**

Ronald Peal was born in Ealing. At the age of 17 he started his long career with the Union Discount Company of London. In the Royal Navy during the Second World War, most of his service was spent in the far east where he survived the sinking of *H.M.S. Prince of Wales* by the Japanese. An active member and one time Master of the City of London Livery Company, the Cordwainers, he was also a Vice President of Rosslyn Park F.C. A man of great faith he variously served his parish churches as Treasurer, Church Warden and as a member of his Diocesan Synod. Plate 1 shows Ronald with his wife Betty, to whom the Club conveys its most sincere sympathy, at the 20th International Ornithological Congress in New Zealand in 1990.

Ronald's interest in ornithology was lifelong. His particular interests included the birds of N.W. Morocco where he was a frequent visitor, and the history of ornithology. Papers by him appeared in a wide range of journals including *Ibis* and the *Bulletin*. Between 1964 and 1966 he conducted a national survey of Wrynecks *Jynx torquilla* for the British Trust for Ornithology. From 1981 to 1985 he served on the Council of the British Ornithologists' Union (BOU).

He particularly valued the Club. Often accompanied at meetings by Betty, he was elected to the Committee in 1969. He was the Club's Hon. Secretary for 18 years from 1971, then a low point in the Club's fortunes, Chairman from 1989 to 1993, and continued on the Committee until 1997. Supported by other long serving officers including Diana Bradley, Sir Hugh Elliott, and Dr. James Monk, he was strongly instrumental in reviving the Club's vitality. It was very appropriate that Ronald was Chairman of the Club for its Centenary Celebrations in 1992. The extent of his many contributions was recognised in 1993 when past and present members of the Committee presented him with a specially commissioned painting of a Wryneck by Robert Gillmor.

Additional to his sustained and vital influence on the life of the Club, Ronald was also deeply interested in its history and development. In the special first part of the 100th volume of the *Bulletin* (Peal 1980) he contributed a particularly informative paper on the early history of the Club and the *Bulletin*. It was a custom for the Chairman to address the Club following each Annual General Meeting but this lapsed in 1941. Ronald restored the custom in 1990, giving a typically well researched and scholarly account of the Club's history and progress in the preceding 50 years (Peal 1990). A sensitive man, he was concerned that the ornithological contributions of the Club's benefactors should be a matter of published record. Thus, in 1991 his Chairman's address was devoted to F. J. F. Barrington and Herbert Stevens (Peal 1991). In his 1992 address he examined some precedents for the formation of the Club by members of the BOU (Peal 1992) and the following year (Peal 1993) dealt with important aspects of the Club's history between 1968 and 1992 which he had not covered in his earlier presentations. An independent thinker, he understood the importance to



Plate 1. Ronald and Betty Peal at the 20th International Ornithological Congress, Christchurch, New Zealand, in 1990. (Photograph: Mrs A. M. Moore)

biological science and conservation of museums, historic collections, and continuing research into avian systematics and taxonomy. Predictably, in his address at the Club's centenary dinner on 19 November 1992 (reported in *Bull. Brit. Orn. Cl.* 113: 3–7), he expressed his genuine regret at the little importance currently attached to avian taxonomy in Britain, and described the centenary publication of the Special Centenary Volume of the *Bulletin, Avian Systematics and Taxonomy* (Monk 1992), as “an exciting development”. For the same reasons he would have been equally excited and supportive of the November 1999 conference being held jointly with the Club, Bird Life International, BOU, and Natural History Museum (Tring), *Why Museums Matter: Avian Archives in an Age of Extinction*.

In 1997 he wrote to me requesting “might the committee do all it can to secure the publication of Con Benson's list of type specimens in the museum at Cambridge”. I hope, that from another place, he rejoices at its publication this year.

Pictured in the *Bulletin* (113: 6) seated by Sir Brian Follett at the centenary dinner, he will be remembered as a good and gentle man to whom the Club owes a great deal and for which it is most grateful. During his time as Chairman he marked each Annual General Meeting with a carnation worn in his button hole. In his last Chairman's address (Peal 1993) he recalled that in 1968 he was asked if he was willing to serve as one of the Club's officers. He recorded his response, “as for me, I replied that I was not willing to take office in the Club”—explaining that the statement confirmed his experience in life: “don't trouble to volunteer for a hot seat—if it is the will of God that you shall be in it, you'll end up in it just the same”. Thank God he did, and thank you Ronald. Thank you very much indeed.

References:

- Monk, Dr J. F. (Ed.). 1992. Avian Systematics and Taxonomy. *Bull. Brit. Orn. Cl.* Vol. 112A.
Peal, R. E. F. 1980. A short history of the Club and its Bulletin. *Bull. Brit. Orn. Cl.* 100: 4–13.
Peal, R. E. F. 1990. The Chairman's Address. *Bull. Brit. Orn. Cl.* 100: 116–117.
Peal, R. E. F. 1991. The Chairman's Address: F. J. F. Barrington, Herbert Stevens—Benefactors of the Club. *Bull. Brit. Orn. Cl.* 111: 177–182.
Peal, R. E. F. 1992. The Chairman's Address: The Club. *Bull. Brit. Orn. Cl.* 112: 139–142.
Peal, R. E. F. 1993. The Chairman's Address. British Ornithologists' Club 1968–1992. *Bull. Brit. Orn. Cl.* 113: 131–135.

Revd. Tom Gladwin
Chairman

New distributional information of birds from the State of Morelos, Mexico

by *Fernando Urbina-Torres*

Received 28 October 1997

The Mexican state of Morelos was one of the first in the country to see formal scientific studies of bird faunas, beginning in earnest in the middle of the nineteenth century. Since then, many publications have detailed the birds of the state, including Martín del Campo (1937), Friedmann *et al.* (1950), Davis & Russell (1953), Arellano & Rojas (1956), Miller *et al.* (1957), Rowley (1962), Navarro *et al.* (1991), Urbina & Robles (1992), and Gaviño (1994, 1995). In spite of such interest, the knowledge of the avifauna of the state remains incomplete; the purpose of this contribution is to describe records of 35 species previously unrecorded from the state.

Howell & Webb (1995) provide, for first time, range maps for all species in Mexico. By the general nature of the work, however, those authors could not specifically refer to the tens of thousands of unpublished records used to generate the range maps. While we have found no specific records for Morelos of the following eight species, for which we have documented reports, the occurrence of these species is not surprising and fits well with the status and distribution indicated by Howell & Webb (1995): Eared Grebe *Podiceps nigricollis*, Blue-winged Teal *Anas discors*, American Wigeon *A. americana*, Ring-necked Duck *Aythya collaris*, Lesser Yellowlegs *Tringa flavipes*, Franklin's Gull *Larus pipixcan*, Marsh Wren *Cistothorus palustris*, Brewer's Blackbird *Euphagus cyanocephalus*. For a further 27 species (four of them certainly or probably derived from escaped captive birds) of more notable occurrence we herein provide specific details.

Since 1985, I have been carrying out a series of studies of the distribution of the avifauna of Morelos. My studies have focused on 20 localities across the state (Fig. 1, Appendix). Additional information was extracted from the scientific literature cited above, from a recent regional summary (Howell & Webb 1995), and from records from the following scientific collections: Colección Ornitológica, Instituto de Biología, Universidad Nacional Autónoma de México, Mexico City (COIBUNAM), and the Museo de Zoología, Facultad de Ciencias, UNAM, Mexico City (MZFC). Voucher specimens were collected to document as many records as was possible, and are deposited in the Colección Ornitológica, Centro de Investigaciones Biológicas, UAEM (COCIB); photographic documentation is available for examination on request from the author.

NEOTROPIC CORMORANT *Phalacrocorax brasilianus*

I observed and photographed individuals of this species at Los Carros on 17 March 1992 (2 individuals), 17 May 1992 (2), 6 April 1992 (1), 12 June 1993 (6), and 16 July 1994 (3). On 21 February 1996, R. D. Durtsche examined an individual trapped in fishing nets, also at Los Carros. On the Río Amacuzac, near Atlapa, Guerrero, two

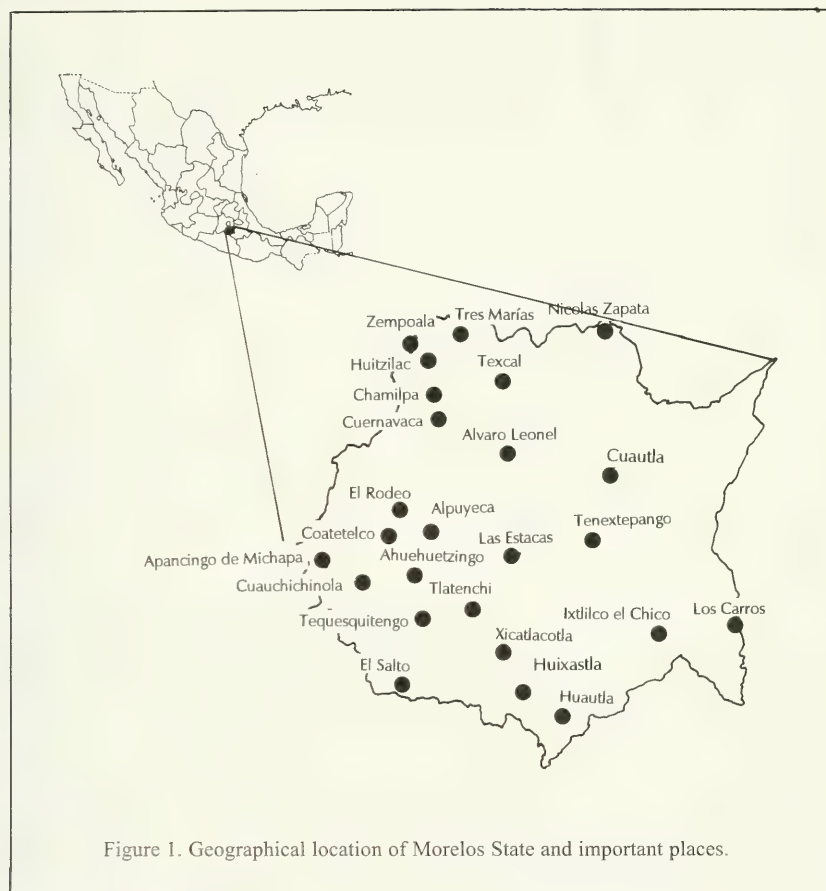


Figure 1. Geographical location of Morelos State and important places.

individuals were observed perched on dry trunks in the middle of the river. Friedmann *et al.* (1950) reported this species' occurrence in interior Mexico in Guerrero, México, and Guanajuato.

BARE-THROATED TIGER-HERON *Tigrisoma mexicanum*

One individual in immature plumage was observed and photo-graphed on a rock along the Río Amacuzac, 20 km SE of Huixastla, on 18 March 1993. The closest record of this species is from coastal Guerrero (Friedmann *et al.* 1950).

WHITE IBIS *Eudocimus albus*

One individual was observed at Coatetelco in a flock of White-faced Ibis *Plegadis chihi* on 19 November 1994. The closest record of this species is from coastal Guerrero, and it has been recorded in interior Mexico in Guanajuato (Friedmann *et al.* 1950), and Coahuila and Nuevo León (Howell & Webb, 1995).

BLACK-BELLIED WHISTLING-DUCK *Dendrocygna autumnalis*

This species has been observed and photographed in winter and summer in great numbers. Two individuals shot in July 1992 were photographed and examined in detail; one had an odd white band on the chest. Records include 3 on 1 January 1987 at El Rodeo, Miacatlán; 2 on 2 July 1992 at 3 km SW Alpuyeca, Miacatlán; 13 on 26 July and 2 on 3 August 1994 at Apancingo de Michapa, Coatlán del Río; and 1 on 23 January 1996 at Coatetelco, Miacatlán. The closest record of this species is that of AOU (1983), who reported this species as resident in the Valley of Mexico; Wilson & Ceballos-Lascuráin (1993), however, correctly pointed out that the species, although recorded there, is a rare vagrant.

MALLARD *Anas platyrhynchos platyrhynchos*

One adult male was observed and photographed in Cuernavaca in December 1992. This bird was believed to be wild, but the possibility of it being an escapee cannot be excluded. Arellano & Rojas (1956) reported this species from the Valle de México, and Leopold (1977) mentioned that their migrations reached at least central Mexico; Saunders & Saunders (1981, in Howell & Webb 1995) report that this species formerly occurred regularly to central Mexico.

OSPREY *Pandion haliaetus*

This species has been observed at several reservoirs around the state: Tlayca (December 1995), Ixtlilco el Chico (December 1995), and El Rodeo (9 December 1989). At Los Carros, it was observed monthly from March 1991 through February 1993, and eight individuals were recorded along about 55 km of the Río Amacuzac between Huixtla and Atenango del Río, Guerrero from 17 to 19 March 1993. In July 22–26, an immature individual was observed at Huautla. One immature female and an adult male were recorded at Coatetelco, 11 October 1996. Two individuals killed in fishing nets have been inspected, from one of which a feather was saved. Friedmann *et al.* (1950) presented records of this species from Guerrero, Distrito Federal, and México.

WHITE-TAILED KITE *Elanus leucurus*

A pair of this species was filmed on video by H. Mejia-Mojica on a dry trunk in the middle of agricultural fields at Los Carros (11 December 1992). It has also been recorded there in November 1991 (1 individual), January 1993 (1), December 1993 (2), 7 July 1995 (4), and on 30 August 1996, when one individual was observed eating a lizard. This species has extended its range in the region dramatically since 1960 (Eisenmann 1971). The closest record is from the Distrito Federal (Wilson & Ceballos-Lascuráin 1993).

HARRIS' HAWK *Parabuteo unicinctus*

This species has been observed and photographed on several occasions, usually perched on dry trunks in grassy areas, as follows: Alpuyeca, 23 March 1989 and 3 October 1987 (single individuals); Cuachichinola, 23 January 1990 (1), Los Carros,

17 October 1991 (1), 13 November 1991 (2), 9–10 December 1991 (1), 17 February 1992 (3), 17 March 1992 (3), 10 April 1992 (1), 21 January 1993 (1), and 27 February 1993 (1), Ahuehuetzingo, single individuals on 23 March 1989, 3 October 1987, 25 April 1993, and 3 August 1994. Closest records of this species are from Puebla and Distrito Federal (Macouzet 1993).

BLACK-COLLARED HAWK *Busarellus nigricollis*

One individual was observed perched on a dead trunk and also in flight on the Río Chalma near Cuachichinola on 19 November 1985. At a range of c. 10 m, the white head and black breast mark were clearly seen, as were the black border to the wings in flight. The area where it was seen has a small stream and small pools used by cattle. Macouzet (1993) mentioned two records from the state, but did not give specific localities; otherwise, the closest localities known for this species are in Guerrero (Friedmann *et al.* 1950).

RED-SHOULDERED HAWK *Buteo lineatus*

An immature female was collected on 18 January 1988 in riparian forest at Tlatenchi (COCIB 1571). An adult was observed in riparian vegetation at Coatetelco, 11 October 1996. Nearest known records are from the Distrito Federal (Friedmann *et al.* 1950).

BROAD-WINGED HAWK *Buteo platypterus*

A female banded on 5 December 1970 in Florida was recovered on 2 October 1974 in Morelos (Bird Banding Laboratory, U. S. Fish & Wildlife Service, pers. comm.). Nearest known records are from the Distrito Federal (Wilson & Ceballos-Lascuráin 1993).

ZONE-TAILED HAWK *Buteo albonotatus*

One individual was observed at Los Carros on 27 February 1993 and on 22 January 1994, in the latter case flying among a group of Turkey Vultures *Cathartes aura*; another single individual was observed and photographed at El Salto on 14 August 1996. Although other observations of this species for the state were reported by Cruz (1983) and Gaviño (1995), the above records appear to be the first winter records for the state.

GREAT BLACK-HAWK *Buteogallus urubitinga*

This species has been observed regularly at Los Carros, perching in trees at the edge of the forest or soaring on thermal air currents; on a few occasions, it has been observed fishing at the water's edge. In 1992, it was observed and photographed on 10 April (2 adults and 1 immature), 6 May (1 adult), 15 July (2 adults), 5 August (1 adult), 9 September (1 adult), 19 October (1 adult), and 11 December (1 adult). Macouzet (1993) reported records of the species in the state, but did not provide any details; otherwise, the nearest records are from the coast of Guerrero, where it is a permanent resident (Howell & Webb, 1995).

LAUGHING FALCON *Herpetotheres cachinnans*

One individual was observed perched on a "cazahuate" (*Ipomoea* sp.), at Xicatlacotla on 8 February 1991; calls of this species were recorded at Huautla on 23 July 1996. Friedmann *et al.* (1950) reported this species for the states of Guerrero and Puebla.

APLOMADO FALCON *Falco femoralis*

I observed one individual perched on a powerline post in Colonia Alvaro Leonel, close to Cañón de Lobos, in March 1988. It was seen at close range and its moustache stripe was clearly seen. Closest records are those of permanent residents from the coast of Guerrero in the border with Oaxaca (Howell & Webb, 1995).

SNOWY PLOVER *Charadrius alexandrinus*

I collected an adult male (COCIB 1468) of this species at Coatetelco on 28 November 1987, which was associated with five other individuals. Although Howell & Webb (1994, 1995) indicate that this species is found in central Mexico, it apparently has not been recorded previously from Morelos.

NORTHERN JACANA *Jacana spinosa*

H. Mejia-Mojica and B. Stewart (pers. comm.) observed one adult individual at Las Estacas on 26 December 1986. Another record, from Cocoyoc, was reported by Márquez (1986). Otherwise, the closest record is from the Distrito Federal (Wilson & Ceballos-Lascuráin 1993).

BLACK-NECKED STILT *Himantopus mexicanus*

H. Mejia-Mojica collected an individual at Apancingo de Michapa on 17 April 1988 (COCIB 1590). Additional individuals have been observed and photographed at El Rodeo on 4 January 1987 and 17 January 1993 (group of 20); Coatetelco on 5 May 1987, 28 November 1987, and 17 October 1994; and Los Carros on 11 December 1992. Although Howell & Webb (1995) indicated a broad distribution for this species in central Mexico, Friedmann *et al.* (1950) reported it for Mexico and Puebla only; Wilson & Ceballos-Lascuráin (1993) reported it for the Distrito Federal.

AMERICAN AVOCET *Recurvirostra americana*

Individuals of this species were observed and photographed at Coatetelco on 15 and 28 November 1988, and on 17 October 1994, as well as at Apancingo de Michapa on 3 August 1994 (11 individuals). Howell & Webb (1995) indicated a broad distribution for this species as a resident in central Mexico, and Wilson & Ceballos-Lascuráin (1993) reported it for the Distrito Federal.

WILLET *Catoptrophorus semipalmatus*

H. Mejia-Mojica observed an individual of this species at Los Carros on 9 April 1996 (pers. comm.). The nearest record of this species is from the Distrito Federal (Wilson & Ceballos-Lascuráin 1993).

LEAST TERN *Sterna antillarum*

I photographed an adult of this species perched on a rock in the middle of the reservoir at Apancingo de Michapa on 3 April 1992. The nearest known record for this species is from the coast of Guerrero (Howell & Webb 1995).

WHITE-FRONTED PARROT *Amazona albifrons*

This species has been observed and photographed in Cuernavaca in January and April 1990, 28 June 1992, and January, March (pairing), October and November 1993. These individuals presumably represent escapees from captivity.

RED-LORED PARROT *Amazona autumnalis*

This species is a common resident in the riparian forest in the barrancas and large gardens around Cuernavaca. As in the previous species, this has presumably become established in the area after release or escape of captive individuals. Groups were frequently observed in the Colonias Palmira and Acapantzingo, in groups of 2–8 moving south to north in the early morning. A pair attempted to nest in a dead palm in March, but the nest was destroyed by a Great-tailed Grackle *Quiscalus mexicanus*.

GREAT SWALLOW-TAILED SWIFT *Panyptila sanctihieronymi*

Two individuals were observed flying near the dam of Cruz Pintada, Huautla, on 23 July 1996; six additional individuals were recorded at the same locality on 24 July. On 7 December 1996, more than ten individuals were observed near the cliffs in Tepozteco, Tepoztlán, as they produced parrot-like calls while flying. The distribution of this swift includes the Pacific coast north to the Morelos-Guerrero border (Howell & Webb 1995).

EUROPEAN STARLING *Sturnus vulgaris*

Three individuals in breeding plumage were observed at Las Estacas on 10 April 1997. They were feeding in grass and over a *Eucalyptus* tree; one of them was carrying nest material. The nearest record of this non-native species is from México City (Wilson & Ceballos-Lascuráin 1993).

NORTHERN CARDINAL *Cardinalis cardinalis*

One individual of this species was observed and photographed on 8 March 1984 and in March 1990; Cruz (1983) also noted this species the northern portion of the state. Wilson & Ceballos-Lascuráin (1993) mentioned March records of this species in the Distrito Federal, and we agree with them that records in central interior Mexico represent escapes of pets.

Discussion

Examination of the distributional maps presented by Howell & Webb (1995) indicated that, for nine of the species recorded herein, my records represent substantial range extensions: *Phalacrocorax brasilianus*, *Tigrisoma mexicanum*, *Eudocimus albus*, *Elanus leucurus*, *Busarellus nigricollis*, *Buteogallus urubitinga*, *Herpetotheres*

cachinnans. The remaining species do not represent great range extensions, based on the maps in Howell & Webb (1995), but the lack of specific, published prior records from Morelos makes their reporting worthwhile.

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Appendix

Localities for field work from which new records were assembled.

Locality	Municipality	Coordinates	Elevation	Habitat
Atlapa	Atenango del Río	10°14'N, 99°3'W	750 m	Riparian forest, agriculture
Alhuehuetzingo	Puente de Ixtla	18°41'N, 99°17'W	1,000 m	Grasslands, agriculture
El Salto	Puente de Ixtla	18°27'N, 99°17'W	1,710 m	Oak deciduous forest
Alpuyecá	Xochitepec	18°44'18.5"N, 99°15'38.9"W	1,000 m	Grasslands, agriculture, deciduous tropical scrub, riparian forest
Alvaro Leonel	Yauatepec	18°54'N, 99°9'W	1,500 m	Grasslands
Apancingo de Michapa	Coatlán del Río	18°41'N, 99°27'W	1,100 m	Grasslands, pond
Cuernavaca	Cuernavaca	18°56'N, 99°14'W	1,500 m	Riparian forest, pond
El Rodeo	Miacatlán	18°46'N, 99°19'W	1,100 m	Grasslands, pond
Coatetlco	Miacatlán	18°44'N, 99°20'W	1,000 m	Riparian forest, pond with aquatic plants (swamp vegetation)
Cuachichinola	Mazatepec	18°69'N, 99°22'W	1,100 m	Grasslands, agriculture
Cuatepetl	Huitzilac	19°2.8'N, 99°18'W	3,190 m	Pine-oak forest
Huitzilac	Huitzilac	19°2.4'N, 99°17'W	2,800 m	Pine-oak forest
El Capulin	Huitzilac	19°05'N, 99°13'W	3,100 m	Pine-oak forest
Zempoala	Huitzilac	19°03.9'N, 99°18.8'W	2,800 m	Pine-oak forest
Tres Cumbres	Huitzilac	19°03'N, 99°17'W	2,800 m	Pine-oak forest
Ixtilco el Chico	Tepalcingo	18°33'N, 98°51'W	1,100 m	Reservoir
Las Estacas	Tlaltizapán	18°12'N, 99°06'W	1,000 m	Riparian forest, spring
Los Carros	Axochiapan	18°36'N, 98°43'W	1,150 m	Reservoir, grasslands and deciduous tropical scrub
Tequesquitengo	Jojutla	18°37'N, 99°16'W	900 m	Pond
Tlaltenchi	Jojutla	18°36'N, 99°11'W	900 m	Riparian forest
Tepozteco	Tepoztlán	19°06'N, 99°06.07'W	2,000 m	Pine oak forest
Texcal	Tepoztlán	18°58'N, 99°10'W	1,740 m	Deciduous tropical scrub
Tenextepango	Ayala	18°44'N, 98°12.5'W	1,275 m	Grasslands, agriculture
Huautla	Tlaquiltenango	18°26'N, 99°1'W	1,200 m	Deciduous tropical scrub, riparian forest
Rio Amacuzac	Tlaquiltenango	18°18'N, 99°13'W	750 m	Riparian forest, river
Xicatlacolla	Tlaquiltenango	18°31'N, 99°11'W	850 m	Deciduous tropical scrub

Status, ecology, and vocalizations of the Five-coloured Barbet *Capito quinticolor* in Ecuador, with notes on the Orange-fronted Barbet *C. squamatus*

by Olaf Jahn, Mark B. Robbins, Patricio Mena Valenzuela, Paul Coopmans, Robert S. Ridgely & Karl-L. Schuchmann

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The Five-coloured Barbet *Capito quinticolor* is a little-studied endemic of the Pacific lowlands of Colombia, where it is known from only a few localities in Chocó, Valle, Cauca, and Nariño (Hilty & Brown 1986, Salaman & Gandy 1994). It was classified as Vulnerable by Collar *et al.* (1994), because of its restricted range and its apparent reliance on closed-canopy wet forest. Recently its habitat has come under severe pressure from man.

In July 1990, Robbins obtained the first records for Ecuador during avifaunal surveys by the Academy of Natural Sciences, Philadelphia (ANSP), and the Museo Ecuatoriano de Ciencias Naturales, Quito (MECN), *c.* 20 km NNW of Alto Tambo (00°57'N, 78°33'W; 350 m), Esmeraldas. Jahn extended the distribution 40 km southwestward, when birds were observed on 5 June 1997 near Playa de Oro commune (00°52'N, 78°47'W; 90 m), Esmeraldas. The species was also encountered by Jahn on 16 September 1997 during a census of foothill forest near Playa de Oro at 350 m, and in July 1998 at *c.* 150 m near Tsejpi commune, Río Zapallo (00°47'N, 78°50'W), Esmeraldas. The latter site is located about 60 km south of the Colombian border and represents the southernmost record for *C. quinticolor*.

In July 1990 the site northwest of Alto Tambo was located at the end of the road as it was being built, and therefore the forest was mostly pristine with secondary forest restricted primarily to the immediate vicinity of the road. Robbins observed and heard this species most days, with as many as six individuals per day, in the canopy of both secondary and primary forest. Birds were seen foraging at melastomes in secondary forest and in treefall areas of pristine forest. Gonad and moult data from five specimens (ANSP 182368-70; MECN 1492; University of Kansas 86748) collected on 17 July indicate that the species was not breeding at that time. All three males had testes 2x1 mm and all five specimens had heavy body moult and light fat. Mass: males, 60.5–64 g; females, 55 and 62 g. Soft part colours for all: iris brown; bill black with greyish base; tarsus grey.

In the Playa de Oro area *C. quinticolor* was uncommon but widespread, with most records from the foothills up to 450 m (*n*=288 censuses of 18 transects; total length 24.1 km; elevational range 50–450 m). The Playa de Oro commune covers *c.* 10,900 ha, and is located about 30 km west of Alto Tambo. Most of the Playa de Oro area was covered by lightly logged mature and primary forest (EcoCiencia 1996, Sierra M. 1996, Jahn *et al.* 1999), and is part of the last large tract of continuous forest in the lowlands and foothills of Esmeraldas, Ecuador, encompassing some

groups of up to five individuals. The fruits of *Castilla elastica* (Moraceae) and of various *Cecropia* species (Moraceae) were identified as important food resources. Further, Mena V. probably found the first ever reported nest of *C. squamatus*. During the morning and afternoon censuses on 15 June 1996, he observed a female of this species entering and leaving a tree cavity 4 m up in a dead stub inside a plantation in the vicinity of San Miguel. In the morning, he also noted a male perching in a nearby tree. This suggests that *C. squamatus* uses mixed-culture plantations for foraging, roosting, and perhaps breeding. Nevertheless, both species do occur syntopically as shown by the following observations at two separate transects in the foothill region (at c. 200 m). In May 1997 Jahn tape-recorded the calls of *C. squamatus* inside closed-canopy forest and four months later the song of *C. quinticolor* was heard in the same area. On 3 August 1997 a pair of *C. squamatus* was observed on a forested

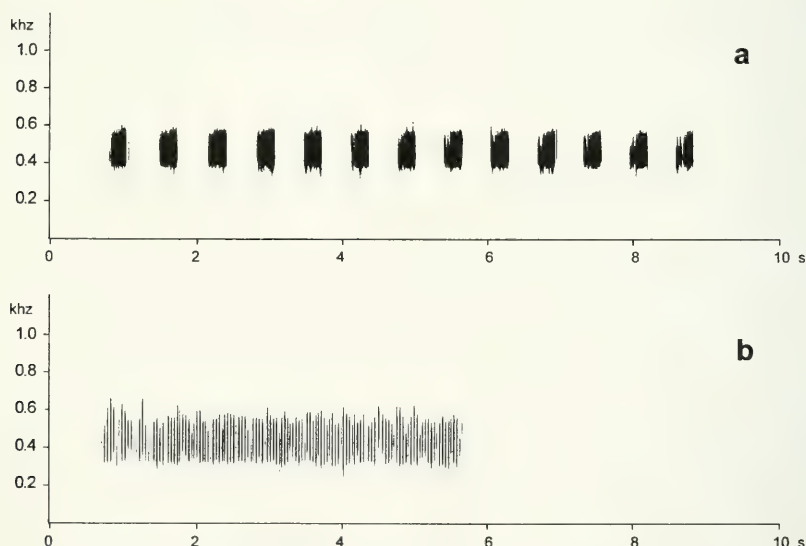


Figure 1. (a) *Capito quinticolor*, male, complete sequence of *oohp* or *oohw* notes of the song. Recorded near Playa de Oro, Esmeraldas, Ecuador, at c. 320 m on 7 May 1997 by O. Jahn. (b) *C. squamatus*, male, one complete song phrase. Recorded in the vicinity of Playa de Oro, at 60 m on 26 September 1996 by O. Jahn. We used Canary 1.2.4 (Bioacoustics Research Program, Cornell Laboratory of Ornithology, 1998) to produce the spectrograms.

ridge, accompanying a mixed-species canopy flock. During a census of the same transect on 7 August 1997 a pair of *C. quincticolor* sang only a few hundred metres from this location.

During Jahn's mist-netting study at Playa de Oro (n=2 transects; lengths 625 m and 550 m; study effort 30,051 net-metre-hours (NMH) and 30,634 NMH, respectively) a total of four individuals of *C. squamatus* were trapped in secondary

scrub inside an overgrown clearing and at a forest border. Two males were captured on 2 March 1996. Their moult data were: a) first male, beginning moult of remiges and rectrices; b) second male, no moult of remiges, rectrices fresh. A third male was captured on 7 November 1996; moult of remiges in the final stage, rectrices showed beginnings of moult. Two days later a female was mist-netted, showing no clear signs of moult. Mass: males, 57.5–59 g; female, 58 g. Soft part colours for all: iris brown; bill grey with black tip; tarsus grey.

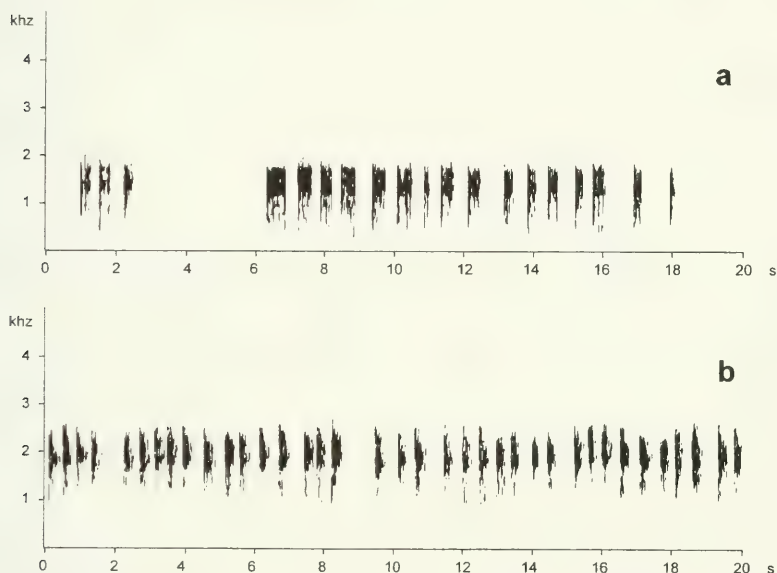


Figure 2. (a) *Capito quinticolor*, male, part of a sequence of excited croaking aarrt-aarrt-aarrt-aar . . . calls. Recorded on the Pueblo Nuevo trail, off the Junín-Tumaco highway Nariño, Colombia, at c. 500 m in August 1998 by P. Coopmans. (b) *C. squamatus*, sex unknown, part of a sequence of excited croaking aark-aark-aark-aar . . . calls. Recorded in the vicinity of Salto del Bravo, Río Bravo, Esmeraldas, Ecuador, at c. 150 m on 14 November 1999 by O. Jahn.

Range and conservation

Our records not only extend the range of *C. quinticolor* southward into Ecuador but also its elevational limits. Presumably it occurs somewhat higher into Ecuador than our records indicate since P. Salaman (pers. comm.) and Coopmans have recorded *C. quinticolor* up to 575 m on the Pueblo Nuevo trail (01°26'N, 78°15'W), Nariño, Colombia, and we assume that the species is found up to at least 600 m. Nevertheless, it has not been recorded at El Placer, Esmeraldas, an extensively surveyed site at 650 m, located just a few km to the south of Alto Tambo (Robbins, Coopmans, Ridgely unpubl. data).

There is a strong precipitation gradient in the province of Esmeraldas, with annual rainfall increasing from less than 1,000 mm in the coastal areas near the town of Esmeraldas to over 4,000 mm in the foothills of the Andes (Lanfer 1995). Because *C. quinticolor* seems to be restricted to wet lowland and foothill forest up to c. 600 m, the region with suitable ecological conditions in northwestern Ecuador is probably limited to a narrow belt only c. 20–50 km wide and c. 110–170 km long, i.e. c. 2,200–8,500 km² (estimated from climate maps in Lanfer 1995). This presumed distribution extends south from the Colombian border east of Mataje to the Río Guayllabamba drainage, which forms the southern border of Esmeraldas. Just to the south the number of humid months (according to Lauer (1952); based on monthly precipitation/temperature ratio) at the appropriate elevational range drops from 11 to 7 per year (Lanfer 1995).

Nonetheless, the confirmed Ecuadorian range of *C. quinticolor* is much smaller, encompassing an area of only c. 20 km wide and 60 km long (1,200 km²). Despite intensive field work by Jahn & Mena V. in this region (from August 1995 to November 1999, they studied 12 different sites in the Río Santiago, Río Cayapas, and Río Onzole areas; n=412 censuses of 41 transects; total length 50.6 km; elevational range 30–450 m), *C. quinticolor* has not been found south of the Tsejpi commune, Río Zapallo, or west of the Río Cayapas. Hence, the estimated range presented above may be too optimistic, perhaps due to some inaccuracies in climate maps (Lanfer 1995).

The Five-coloured Barbet's confirmed distributional range in Ecuador has undergone severe deforestation in recent decades (Dodson & Gentry 1991, Sierra M. 1996, pers. obs.), catalyzed in the last few years by the construction of two new roads. The first road connects Ibarra, Imbabura, a town in the inter-Andean valley, with San Lorenzo, Esmeraldas on the Pacific coast. The second connects the town of Esmeraldas with Mataje on the Colombian border and continues into Colombia. As a direct consequence of these road projects the "Unidad Coordinadora para el Desarrollo Forestal Sustentable en Esmeraldas" (UCE), an NGO which stimulates and coordinates the sustainable use of the timber resources in the region, predicts a severe loss of forest in northern Esmeraldas within the next 10 years, unless management plans for sustainable forestry are fully implemented (Jaramillo *et al.* 1996).

Presently only two protected areas in Ecuador contain potential habitat for *C. quinticolor*:

The reserve "Cotacachi-Cayapas", 204,420 ha (IUCN 1992), in Esmeraldas and Imbabura, ranges from c. 100 m to over 4,500 m (Fundación Natura 1992) and is located in the zone where annual precipitation exceeds 3,000 mm (Lanfer 1995). However, only a few thousand hectares of this reserve are located below 600 m. Mena V. and Jahn did not record *C. quinticolor* in November 1999, during rapid assessment surveys at Charco Vicente (00°41'N, 78°53'W), Río San Miguel, and at Salto del Bravo (00°40'N, 78°57'W), Río Bravo. These two sites represent the lowest elevational range, c. 100–350 m, within the Cotacachi-Cayapas reserve.

The "Awá Ethnographic Reserve", 101,000 ha (Esmeraldas, Carchi, Imbabura) abuts the Colombian border in the Río Mira drainage (Wege & Long 1995). About

28,000 ha of its total area lie in Esmeraldas (Jaramillo *et al.* 1996). This section is located below 600 m, probably in the zone with an annual precipitation above 3,000 mm (Lanfer 1995). An additional few thousand hectares of suitable habitat are located in Carchi. Little ornithological work has been carried out within the Awá reserve (Wege & Long 1995) and future investigations should strive to clarify the status of *C. quinticolor* there.

In summary, only a few hundred square kilometres of the potential range of *C. quinticolor* and other foothill endemics in Ecuador are located within legally protected areas of the country, and even the conservation status of these protected areas is not secure (Jahn & Mena V., pers. obs.). The situation seems to be more hopeful in the Colombian part of its range, where this Chocó endemic has been recorded at a number of recently surveyed sites, and where about 60% of the Pacific lowland and foothill forest remains intact and largely unthreatened in the immediate future (P. Salaman, pers. comm.).

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The races of the Isabelline Shrike *Lanius isabellinus* and their nomenclature

by D. J. Pearson

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The Isabelline (or Red-tailed) Shrike *Lanius isabellinus** is usually regarded as comprising four races. Two of these breed in central Asia and migrate southwestwards to winter in Arabia and NE Africa. The other two breed in N China and make shorter migrations to winter from Pakistan and NW India to Iran.

*Often treated in the past as conspecific with the Red-backed Shrike *L. collurio* (e.g. Vaurie 1959) or with both Red-backed Shrike and Brown Shrike *L. cristatus* (e.g. Dement'ev & Gladkov 1954, Voous 1960), but regarded here as a separate species, following recent authors such as Panov (1983, 1996), Cramp & Perrins (1993) and Glutz von Blotsheim & Bauer (1993).

In west central Asia, *phoenicuroides* breeds from Iran and Afghanistan to S Kazakhstan. The male is brown above with a rufous crown, a black face mask and pink-tinged white underparts; the flight feathers are blackish when fresh, and show a conspicuous white patch at the primary bases; the rump and tail are bright rufous. Paler birds with greyer head and upperparts occur within the range of *phoenicuroides*, typically in lowland areas. These have been treated as a distinct race, *karelini*, by some Russian authors (e.g. Stepanyan 1990), but are regarded as variants of *phoenicuroides* by Roselaar (1993). Female *phoenicuroides* differs markedly from the male, having a dark brown face mask, dark brown flight feathers, usually with a creamy primary patch, and finely barred sides and flanks. A rufous-tinged crown typically contrasts with a drab brown mantle.

In east central Asia, a paler race ranges through Mongolia to Transbaikalia and south to the N China borders. This form was named *speculigerus* by Vaurie (1959), who apparently followed Kozlova (1930) and Stegmann (1930), and this has been followed in turn by recent authors, including Panov (1983, 1996), Cramp & Perrins (1993), Glutz von Blotsheim & Bauer (1993) and Lefranc & Worfolk (1997). The male has a black face mask, blackish brown flight feathers and a white or whitish primary speculum like *phoenicuroides*, but is uniformly isabelline-grey above, including the crown, and pale creamy buff below with a vinous tinge. Females are like those of *phoenicuroides*, but more uniform sandy grey-brown, with buff rather than whitish underparts and no warm tinge on the crown.

Another isabelline form breeds in the Tarim basin of NW China. This was regarded as nominate *isabellinus* by Stegmann (*op. cit.*) and Vaurie (*op. cit.*), and more recently by e.g. Stepanyan, Cramp & Perrins, Glutz von Blotsheim & Bauer and Panov. Males resemble *speculigerus* in body colouration, but are slightly paler, with the rump and tail paler rufous. They differ in having much paler, grey-brown flight feathers, usually with little or no white visible at the primary bases, and in showing little contrast between buff edged tertials and wing-coverts and the pale sandy grey-brown mantle. The mask is brownish and incomplete on the lores. Further east, the Tsaidam depression in N China is occupied by the similar but slightly larger *tsaidamensis*. Sexual dimorphism is much less marked in these Chinese forms than in those of central Asia.

L. i. phoenicuroides and *speculigerus* breed later and have longer migrations than the Chinese races. In keeping with this they differ slightly in structure; they have a larger wing/tail ratio (see Cramp & Perrins 1993) and the second primary is usually longer than the sixth (it is equal to or shorter than the sixth in *isabellinus*). They also have a different moult strategy (Stresemann & Stresemann 1972). Practically all birds wintering in Africa and most of those in Arabia have a complete moult after arrival, finishing between January and March, and this affects first-year birds as well as adults. In *isabellinus sensu* Vaurie, on the other hand, adults usually renew their entire plumage before autumn migration, and young birds retain their juvenile primaries until about a year old. This moult difference is not, however, completely clear-cut. Some *speculigerus*, and even *phoenicuroides*, moult some primaries in the breeding area or during autumn migration halts (Neufeldt 1978), and a few have

completed moult in Arabia in autumn. Some *isabellinus*, on the other hand, appear to reach India before moult is completed.

Structurally and physiologically, *phoenicuroides* and *speculigerus* seem closely allied, and Neufeldt (1978) treated them together as a species distinct from the Chinese birds. Panov (1996) however stresses the strong similarity between *speculigerus* and *isabellinus* as regards plumage and bill colour. These two races have been reported to interbreed (Stegmann 1930), and have been treated together in the past, as a single race (e.g. Stresemann 1927) or as races within a species separate from *phoenicuroides* (Dolgushin *et al.* 1970, Kryukov & Panov 1980).

Earlier writers on Africa (e.g. Jackson 1938, Chapin 1952, Mackworth-Praed & Grant 1952, Archer & Godman 1961) used the name *isabellinus* for the pale race of Isabelline Shrike wintering there. I have pointed out, however (Pearson 1979), that of the races described by Vaurie only *phoenicuroides* and *speculigerus* reach Africa, and in the Natural History Museum, Tring, collection I was unable to find any examples of *isabellinus sensu* Vaurie from west of Iraq. This contradiction appears to result from the different racial names used by Stresemann (1927) and Stresemann & Stresemann (1972) on the one hand and Stegmann and Vaurie on the other. African writers were presumably following Stresemann (1927), who used nominate *isabellinus* for pale birds wintering in both Africa and India, and did not then recognise a separate Mongolian race.

When discussing moult in the Isabelline Shrike, Stresemann & Stresemann (1972) again initially placed the isabelline forms wintering in Africa and India together. But they recognised that two different moult groups were involved and went on to reserve *isabellinus* for migrants to Africa which moulted in winter, and used *arenarius* Blyth 1846 (together with *tsaidamensis*) for migrants to India which moulted in summer. They assumed that their *isabellinus* was distinct from Vaurie's *speculigerus*, but they were not able to say exactly where the former bred, nor where the latter wintered. In fact, the Stresemanns' *isabellinus* and Vaurie's *speculigerus* would seem to be one and the same; there appears to be only one race of isabelline birds with a black mask and dark flight feathers breeding in east central Asia.

To establish the correct names for the races of *L. isabellinus* it is necessary to refer back to the type specimen. Mauersberger (1980) evidently assumed that Stegmann, in his 1930 review, had been unable to do this. The type is a male collected at Kumfuda in western Arabia by Hemprich and Ehrenberg (1833). Their description reads as follows: '*Magnitudine LANII rufi. Isabellinus, supra leviter cinerascens, subtus albicans, cauda cinnamomea parum gradata unicolore, taenia nigra per oculos ducta supra albo limbata, gula et crissa albis, remigibus nigricantibus fascia media alba, rostro pallido dorso et apice nigricante*'.

This clearly indicates the Mongolian rather than the Tarim basin race. Gerhard Nikolaus has kindly located and examined this specimen for me at Berlin Museum. He confirms that it is an example of *speculigerus sensu* Vaurie, freshly moulted, and like the isabelline birds wintering in the Sudan Nile Valley. Dr Sylke Frahnert has since kindly sent me photographs. These show a black face mask complete across the lores, blackish brown wings with white on the primary bases extending about 4



Plate 2. (a) lateral and (b) dorsal view of the type specimen of *Lanius isabellinus isabellinus*. Photographs courtesy of Sylke Frahnert, Berlin Museum.

mm beyond the primary coverts, and the second primary tip falling between those of primaries 5 and 6 (see Plate 2).

Thus, the nominate race of the Isabelline Shrike is the Mongolian form, and the name *speculigerus* Taczanowski 1874 becomes a synonym. A new name is needed for the Tarim basin birds, and Stresemann's *arenarius* is available. We have then two distinctive central Asian forms that migrate to Africa and Arabia, *phoenicuiroides* and *isabellinus*, and two similar N Chinese races that migrate to India, *arenarius* and *tsaidamensis*.

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A new montane subspecies of *Sheppardia gunningi* (East-coast Akalat) from Tanzania

by J. Fjeldså, M. S. Roy & J. Kiure

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The Nguu (Nguru North) Mountains in Tanzania constitute a very steep montane area, which is part of the famous Eastern Arc Mountains but rather isolated at the edge of the dry Maasai steppe. The first ornithological survey of these mountains was conducted by the 'Project Mount Nilo '95 Expedition' from the University of Cambridge, U.K. (Seddon *et al.* 1995). Among the interesting discoveries was a population of akalats, identified as *Sheppardia gunningi*, East-coast Akalat. Many birds were mist-netted and photographed, and a good description was provided in the trip report, but no specimens were collected.

Some concerns about the identity of these birds might exist because of the similarity of akalats species (at least in certain field guide illustrations) and because other Tanzanian montane forests are occupied by *S. sharpei*, Sharpe's Akalat (while *S. gunningi* inhabits coastal forests below 300 m in Tanzania). In order to settle the identity of this population, Jacob Kiure visited the Nguu Mts again 13–29 November 1996, and collected a series of specimens which are now kept in the Zoological Museum, Copenhagen (ZMUC). The Nguu population clearly represents *S. gunningi*, but differs from adjacent coastal populations, morphologically and genetically. We will describe it here as a separate subspecies, which we name.

***Sheppardia gunningi alticola* ssp. nov.**

Holotype. ZMUC kat.nr. 92.216, adult male, 27 November 1996, Lulago Forest in Nguu Mts (5°34'S, 37°28'W).

Paratypes. ZMUC kat.nr. 92-217-29, collected in the Nguu Mountains by J. Kiure, in Gombero Forest 13–25 November and Lulago Forests 27–29 November. Also tissue samples of all specimens are deposited in the ZMUC.

Etymology. The subspecific name emphasises its isolated occurrence in a high-altitude habitat island.

Description of the holotype. Capitalised colours refer to Ridgway (1912). Upperparts from forehead to rump olive-brown (ranging from Mummy Brown on top of head to Dresden Brown back, with buffy white subapical spot on lower rump feathers), upper tail Deep Quaker Drab with olive-brown outer edge basally. Lower forehead, lores and lower orbital area Dark Quaker Drab, separated by semi-concealed and faint whitish stripe from Deep Neutral Grey upper lore, superciliary and upper posterior orbital area; cheeks and ear-coverts greyish olive-brown. Upper wing-coverts Neutral Grey, greater coverts with olive-brown outer edge; remiges Deep Neutral Grey with olive-brown outer webs on tertials and secondaries, light grey on primaries; inner webs creamy white, broadest on tertials and secondaries. Underparts from chin to under tail coverts and axillaries Yellow-ocher/Deep Chrome, with white basal parts of feathers shining through on chin and upper throat, belly Light Orange-Yellow, white centrally; upper flanks washed olive-brown; under wing coverts dark greys broadly tipped white. Bare parts: bill uniform dark brown; iris dark reddish-brown; legs pink-grey, soles yellow. Measurements (mm): wing 72.2 (method 2 of Svensson 1992), 5th fully developed primary (in descending order) longest, exceeding 4th-1st by 1.3, 5.6, 16.2 and 34 mm, respectively; culmen 12.6; tarsus 21.8; tail 55.

Diagnosis. Differs from *S.g. sokokensis* of the adjacent coastal zone by large size, distinctly darker grey face, more chrome-yellow underparts with restricted white on belly. Large size and restricted extension of white on the belly approaching *S. g. bensoni* from Malawi which, however, has a more prominent white loreal stripe and a warmer general colouration.

Individual variation. Seddon *et al.* (1995) provided a general description based on 21 mist-netted birds, which suggests no individual variation in plumage colours. Weights were 14.5–20.0, average 17.3 g (measurements given for these live birds are not useful for comparison with museum specimens). We examined 13 collected specimens, 10 adult, 1 immature and 2 fledglings. Adults were constant in appearance, some specimens slightly more buffy citrine on lower back. The immature was lighter overall, with tips of greater wing-coverts and narrow edges of tertials cinnamon-buff. Fledglings were Clove Brown above, each feather with large Cinnamon-Buff spot centred on feather shafts and especially the greater wing coverts margined black; below buffy, to white on belly, with feathers of throat, breast and sides edged Fuscous. Wings of 5 adult males (incl. type) 70.0–75.0 (average 73.0), six females 68.0–72.2 (average 69.7).

Distribution. *Sheppardia gunningi alticola* is evidently endemic to the Nguu Mountains in northwestern Tanga, Tanzania (5°27–38'S, 37°26–36'E). Here, forest exists from 850 to 1,750 m, as four main fragments and some small fragments on lower hills nearby, with altogether 140 km² forest cover (1:250,000 Land Cover Maps of Tanzania, based on satellite imagery from 1994–6).

Comparison with other akalats

Notes on akalats specimens have been taken during several museum visits: The American Museum of Natural History (New York), Kenya National Museums (Nairobi), The Marshal Field Museum (Chicago), The Natural History Museum (Tring) and the Milwaukee Museum. Specimens were borrowed in 1998 for direct comparison with Nguu specimens from The Natural History Museum. The subspecies variation is reviewed in Benson (1947) and Keith *et al.* (1992). *S. g. sokokensis* (coastal forests of Kenya and Tanzania, from lower Tana River to Rondo area) varies from Buff-Yellow to a rich Yellow-ochre on the breast, with extensive white belly and buff vent (the pale-breasted birds being immatures), and lores and supercilium are brighter bluish grey than *alticola* (Benson 1947). It is small (wing of 11 males 67–72, average 70.5, 7 females 63–72, average 65.6). *S. g. bensoni* (Malawi) is much more richly coloured, Cinnamon-brown to Dresden Brown above and uniform Ochraceous-orange below, from chin to vent, except for a lighter Ochraceous-buff lower belly with a small white central stripe. It resembles *alticola* in the restricted extension of white on the belly and by its large size (wing of 8 males 72–78, average 74.8, 3 females 68–70, average 69.0), but differs clearly in having a more conspicuous white lore stripe and a general colouration much more like *S. cyornithopsis* and *aequatorialis*, Common and Equatorial Akalats. *S. g. gunningi* (Mozambique lowlands) has restricted dull grey lores and supercilium, and is rather dull coloured overall (almost as *S. sharpei*), Snuff Brown above and rather brownish orange (Ochraceous-Tawny to Cinnamon Buff) on the breast, and with extensively white belly and Light Buff vent; size small (wing of 13 males 72–76, average 74.1, 4 females 65–68, average 67.2). Weights (in g) for *S. g. gunningi* are 17–20, average 18, for 8 males; 16–17, average 16.7 for 3 females; for *S. g. sokokensis* 13 and 17 for two males and 12–15.3, average 14.1 for 7 females (Keith *et al.* 1992).

Molecular data

Differentiation at the DNA level was studied as part of a broader evolutionary study of akalats (unpublished). We report here only on those data which are relevant for evaluating the systematic relationships of *S. gunningi*.

Blood and feathers sampled from the field were stored in a DMSO/NaCl solution (Seutin *et al.* 1991). Two samples per site were used. DNA extraction and amplification followed standard protocols for single stranded template Dideoxy sequencing. Sequence data were compared from two mitochondrial DNA (mtDNA) genes, namely 302 base pairs of the Cyt b gene (amplified using the primer pair L15546 and H15915; Edwards *et al.* 1991) and 308 base pairs of the mtDNA ND2 gene (using primers H5578 and L5215; Hackett 1996). Sequences were aligned visually using the program SeqApp (Gilbert 1992), and aligned sequences were analysed using parsimony for phylogenetic reconstruction (PAUP vers. 3.1.1, Swofford 1991) and bootstrap analysis (Felsenstein 1985). Gene sequences were combined into a total evidence data set.

Fig. 1 shows the most parsimonious tree of 200 steps. There is full bootstrap support for a sistergroup relationship between *S. gunningi* and *S. sharpei*, with all members of each species placed together, and an average sequence divergence of

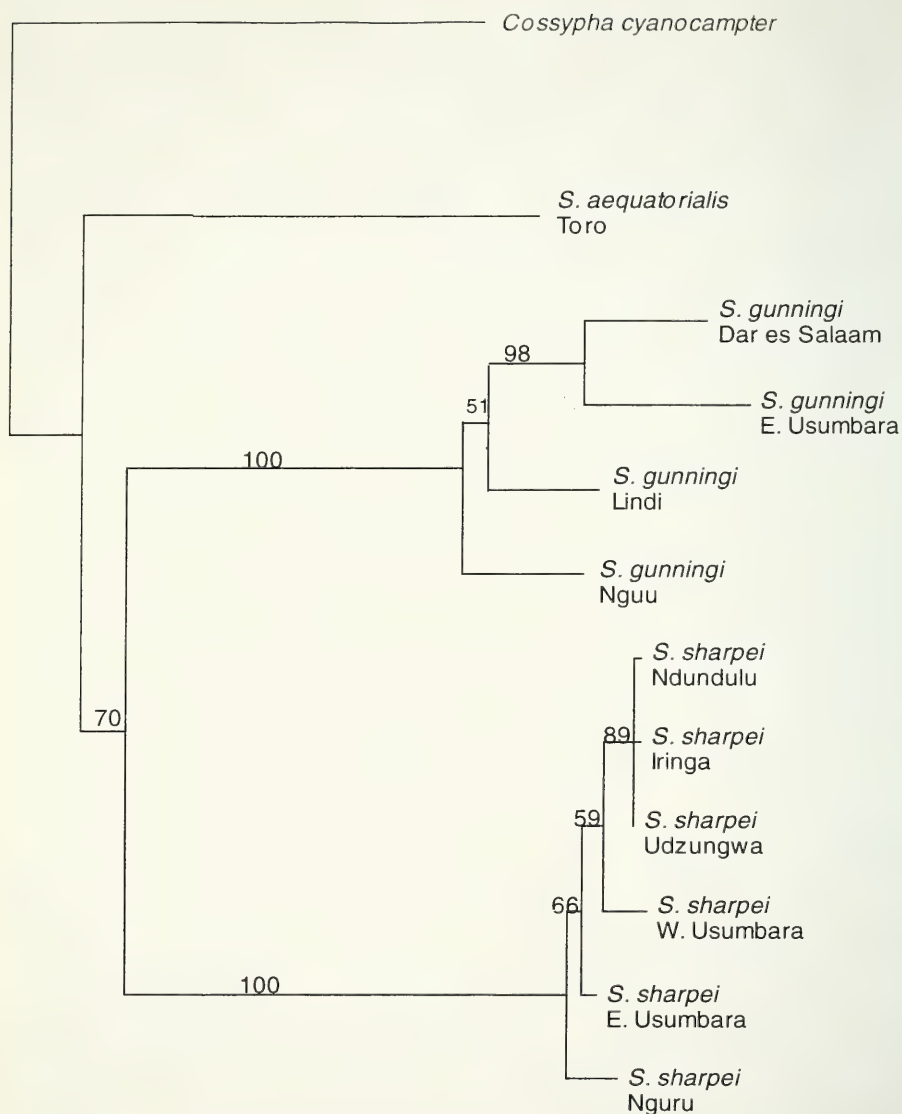


Figure 1. Phylogeny of three closely related akalats of eastern Africa, based on two mtDNA gene fragments of altogether 611 bp. Parsimony analysis with 3rd position transversions weighed 10 times transitions; figures give per cent support from >500 bootstrap replicates. *S. cyornithopsis* (not shown) clusters closely together with *aequatorialis*, and these two could well prove to be conspecific (Dowsett & Dowsett-Lemaire 1993). Other akalats species form much deeper branches which are not well supported (unpublished data).

11.45% between them. It is noteworthy that all *S. sharpei* samples (which include representative of populations collected southwest and east of the Nguu Mountains) form a very close-knit group with an average sequence divergence of only 0.9% between disjunct populations. The *S. gunningi* samples were much more dissimilar, with an average sequence divergence of 3.6% between populations. The Nguu samples differed from three other populations, all from coastal forests, by an average of 3.8%.

Ecology

S. gunningi alticola was common in the Nguu Mts, both in the Gombero and Lulago Forests. It was observed, mostly single birds, on the ground and flitting between low perches in undisturbed submontane forest at 1,140–1,750 m, in areas with tangled understory vegetation, often near streams and moss-covered logs. Two fledglings were collected 23 November at 1,500 m in Gombero Forest. Besides arthropods, the birds eat berries and seeds (Keith *et al.* 1992 reported the species to be insectivorous). Although situated in a slight rainshadow, the Nguu Mts receive orographic rain and probably also some mist precipitation. While some parts of the forests are rather dry, the east slopes have evergreen forest dominated by *Albizia*, *Antiaris*, *Celtis*, *Cissus*, *Olea*, *Teclea* and *Zeyherella*, with 60% canopy cover, mainly at 25–30 m, with huge *Newtonia* trees locally, and mainly *Albizia*, *Diospyros* and *Olea* on dry ridges (Lovett & Pócs 1993; Seddon *et al.* 1995). Lianas and *Piper* thickets are abundant. The adjacent lowlands are woodland, bushland and bushed grassland. The species is known mainly from lowland forests, where it can be very patchy, favouring valley bottoms with a dense canopy and dense understorey thickets formed around fallen trees. Newmark (1993) found that it was vulnerable to habitat fragmentation. There are, however, some records from heavily logged, secondary and rather dry and open sites (Dowsett-Lemaire 1989, Keith *et al.* 1992, Collar *et al.* 1994).

Discussion

The majority of the endemic forest birds of eastern Africa (east of the Albertine Rift zone; see Hall & Moreau 1970, Stattersfield *et al.* 1998, Burgess *et al.* in press) can be classified as being either coastal or montane. They comprise independent species (probably isolated since the initial breakup of the species rich Pan-African Rainforest in the upper Miocene; Fjeldså & Lovett 1997) or representatives of more recent radiations. There are relatively few cases of vicariance within the eastern forest zone, comprising (1) speciation (and subspeciation) by isolation in different montane areas (exemplified by the *Andropadus fusciceps/nigriceps* group by Roy *et al.* 1998) and (2) a vicariance pattern with sister species inhabiting montane and coastal zones, as in *Tauraco livingstonii/fischeri*, *Pogoniulus simplex/leucomystax*, *Phyllastrephus placidus/fischeri*, the eastern *Batis* group, *Athreptes longuemareii/neglectus*, *Serinus melanocephalus/burtoni*, and in the akalats. The akalats represent a rather complex situation with *Sheppardia lowei* and *montana* (Iringa and Usambara Akalats) forming a distinctive montane clade (Jensen 1989) with a relict distribution in the Iringa highland, Ukaguru and West Usambara Mts, and *S. gunningi/sharpei*. The latter two are sister species (Fig. 1) replacing each-other in coastal and lower montane forests,

respectively. However, *S. gunningi* lives far inland in Malawi, where *S. g. bensoni* is reported from Mzuzu (Kaningia) and Viphyain to the lake-shore and on the Mulanje and Thyola Mts in the south. Here it inhabits medium rather than high altitude forest (Dowsett-Lemaire 1989). Its very rich and warm colouration, like the closely related *S. aequatorialis* and *cyornithopsis* (Dowsett & Dowsett-Lemaire 1993), and as opposed to more greyish olive-brown upperparts and yellow (*alticola*, *sokokensis*) or buff (*gunningi*, *sharpei*) breast of the eastern populations, suggests that it may represent a relatively deep branch.

The variation in species composition between Eastern Arc mountains suggest a high level of local extinction (Fjeldså & Rabøl 1995, Cordeiro in press). The Nguu population of *S. gunningi* could be interpreted as an opportunistic colonisation in response to the disappearance of the montane *S. sharpei* from one 'inselberg'. However, the genetic distinctness of *S. gunningi alticola* suggests that it has been present here since before the differentiation of populations in *S. sharpei*. *S. gunningi* may possibly have inhabited the full range of eastern forest habitats, but was displaced from most montane forests by the successfully expanding *S. sharpei*. The internal branching in *S. sharpei* suggests that its highest genetic diversity is in the east (Usambara and Nguru samples in Fig. 1), so possibly it evolved here and then colonised other mountains. *S. gunningi alticola* could have survived as a relict population since the lower Pleistocene (see Klicka & Zink 1997 for mtDNA substitution rate).

The remaining forests in Tanzania are under severe threat from the growing human population (Lovett & Wasser 1993, Burgess & Clarke in press). Fortunately, because of difficult access, the forests of the Nguu Mts are generally in a fairly pristine state. There has been some extraction of *Khaya* and *Milicia* trees in the past, but very little logging is taking place today and the whole forest area is a Catchment Forest Reserve. The Nguu Mts are recognized as an important water catchment for eastern Maasailand. In view of the small (140 km²) and fragmented range (4 main fragments) (criterion B1 of the current World Conservation Union threatened species criteria; IUCN 1994), *S. gunningi alticola* needs to be considered Near-threatened and Conservation Dependent. The species therefore belongs in the Vulnerable category of Collar *et al.* (1994).

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A reassessment of the subspecies in the Ruwenzori Turaco *Ruwenzorornis johnstoni*

by Michel Louette, Marc Herremans & Alain Reygel

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The Ruwenzori Turaco is an Afrotropical montane forest resident, limited in distribution to mountains of the Albertine Rift in the eastern Democratic Republic of Congo and western Rwanda, western Burundi and western Uganda. The relationship of this bird within the Musophagidae is in dispute and indeed, *Ruwenzorornis* is not universally used; *The birds of Africa* (Fry et al. 1988, hereafter referred to as *BoA*) placed this species in *Musophaga*. We accept *Ruwenzorornis pro tempore*, following *Handbook of the birds of the world* (del Hoyo et al. 1997, hereafter referred to as *HBW*).

Three subspecies have been described:

1. nominate *johnstoni* Sharpe 1901 from Mt. Ruwenzori and its immediate surroundings in Democratic Republic of Congo and Uganda,
2. *kivuensis* Neumann 1908 from the other mountains in Kivu province, Democratic Republic of Congo (Virungas—Mt. Kahuzi area and in Itombwe), from Rwanda and from Burundi—*fide* J. M. Lernoùl (and presumably from extreme south-western Uganda),
3. *bredoi* Verheyen 1947 from Mt. Kabobo (extreme northern Katanga province, Democratic Republic of Congo).

Only the first two have been retained by *BoA*, which merges *bredoi* in *kivuensis*. This is probably a *lapsus calami*, because *bredoi* has usually been synonymized with the nominate race (as in *HBW*). In fact, the only difference generally accepted is that *kivuensis* lacks the bare facial patch present in the (two) other race(s), having this area fully feathered. Verheyen (1947) suggested other characteristics for *bredoi*: shorter crest, smaller bill, general plumage colour more violet and a typically larger red breast spot.

Based on examination of specimens in the Koninklijk Museum voor Midden-Afrika, Tervuren (KMMA) and the Koninklijk Belgisch Instituut voor Natuurwetenschappen (KBIN), we document morphological differences between five populations of the Ruwenzori Turaco, and discuss their taxonomy.

Material and methods

A total of 136 specimens was studied; 99 were measured. Samples included five discrete populations, each restricted to isolated mountains: *johnstoni* (Mt. Ruwenzori area), *bredoi* (Mt. Kabobo), *kivuensis* (Itombwe), *kivuensis* (Northern Kivu, in the Virunga—Mt. Kahuzi area and northern Rwanda), *kivuensis* (Nyungwe forest in Rwanda) Fig. 1.

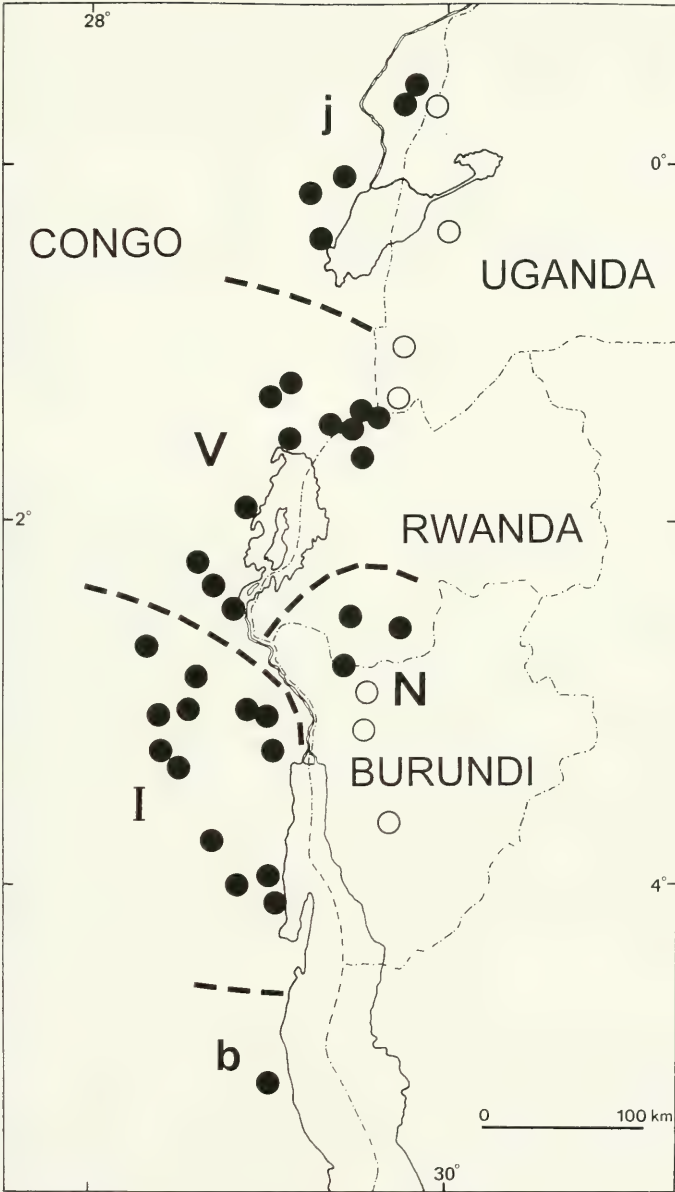


Figure 1. Localities of specimens examined and the delimitation of the five geographical populations studied (filled circles); j: *johnstoni*, b: *bredoi*, V: Virunga area, N: Nyungwe, I: Itombwe. In order to complete the world range of the species, the records from Burundi (Gaugris 1976) and Uganda (Short *et al.* 1990; Francis & Penford 1993) are added as open circles.

Standard measurements (by ML) of the five geographical population samples are shown in Table 1. The material from KBIN includes the type of *bredoi*.

The flattened left wing was measured with a stopped ruler. The tail was measured from the root of the central tail feathers (Svensson 1992). The culmen was measured from the tip of the bill to the proximal end of the frontal plate, where it touches the feathers. All measurements were taken to the nearest 0.5 mm.

Overall differences between groups were analysed by analysis of variance (ANOVA, Statistica 1997). In the absence of any statistical difference between the sexes (as taken from the labels), data were pooled across sexes. Levels of significance presented for multiple contrasts between groups are 'Bonferroni-compensated' for the number of tests.

AR measured the length of the crest (from skull at the proximal end of the frontal plate to tip of longest crest feathers, see Fig. 2) in all the well-prepared specimens of *johnstoni* and *bredoi*.

Results

Biometrically, most populations differ in one way or the other from each other. The three measurements are significantly heterogeneous, both when all groups are compared and amongst the three *kivuensis* groups (wing $F_{2,51}=8.7$, $p<0.001$; tail $F_{2,55}=9.3$, $p<0.0005$; culmen $F_{2,59}=2.88$, $p=0.06$). Biometrically, the last three form a series, whereby in a two by two contrast the extremes (birds from Nyungwe and Itombwe) differ, while neither is statistically different from the Virunga (central) group (Tables 1–2). This statistical series differs from the geographical picture, where Nyungwe takes the central position rather than the Virungas. On the other hand *bredoi* and *johnstoni* are more distinct from the three *kivuensis* populations and more similar to each other, though *bredoi* has smaller wings (Table 1–2).

Our study points to the existence of five distinct populations. We feel that, in the absence of other documented morphological or ecological differences, the differences in size are too small (though statistically significant) to be used in formal nomenclature, and would make the number of subspecies proliferate. Thus we remain with the sole other morphological characteristic documented: the feathered or bare eye rim. This

TABLE 1

Measurements (mm) of the wing, tail and culmen (see Methods) of *Ruwenzorornis johnstoni* populations. Mean $\pm$ standard deviation (n) are given

	Wing	Tail	Culmen
<i>johnstoni</i>	166.5 $\pm$ 3.79 (17)	182.1 $\pm$ 3.75 (16)	31.1 $\pm$ 1.32 (17)
<i>bredoi</i>	161.9 $\pm$ 2.76 (16)	180.8 $\pm$ 5.66 (16)	30.5 $\pm$ 1.36 (19)
<i>kivuensis</i> (Nyungwe)	170.4 $\pm$ 4.39 (14)	190.8 $\pm$ 4.05 (19)	33.0 $\pm$ 0.94 (22)
<i>kivuensis</i> (Virungas)	167.7 $\pm$ 3.38 (24)	187.3 $\pm$ 4.78 (24)	32.8 $\pm$ 1.42 (24)
<i>kivuensis</i> (Itombwe)	164.6 $\pm$ 3.90 (16)	183.4 $\pm$ 6.04 (15)	33.7 $\pm$ 0.98 (16)



Figure 2. Method of crest measurement in *Ruwenzorornis johnstoni*.

character seems to be stable within the respective populations; *kivuensis* has a feathered eye rim, though immatures have the feathers sparsely implanted, shorter and decidedly less glossy than in adults. Among 84 apparent adult specimens, only two (Lac Lungwe, Itombwe—KMMA 58327; Nyawaronga, Virungas—KMMA 100929) seemed to have more sparse feathering around the eye: these localities however are plainly in the *kivuensis* range, and not particularly close to the *johnstoni* (*bredoi*) range. All 22 *johnstoni* and 19 *bredoi* specimens have a bare eye rim, while the well prepared specimens show a very thin rim of metallic feathers below the bare patch; there does not seem to exist real variation for this character. The difference in occurrence of eye rim types is statistically significant between *kivuensis* and *johnstoni* or *bredoi* (Chi-square; both comparisons $p < 0.0001$). No consistent plumage colour difference between the populations could be found, and none of the plumage characteristics mentioned by Verheyen (1947) hold true for the larger series of *bredoi* now available. *Contra* Verheyen, the crest appears marginally (though not significantly) longer in *bredoi* (mean, in mm, for 4 males: 31.8; 2 females: 30.1) than in *johnstoni* (mean for 4 males: 30.3; 10 females: 29.7).

Taxonomic conclusion

Further study is required (e.g. genetics) to decide if the *Ruwenzorornis* populations indeed form one species, but the generally very similar morphology and vocalisations (Chapin 1939, mentioned that the voice of *johnstoni* and *kivuensis* is very similar) indicate that this is likely to be the case.

Zoogeographically inconsistent is the fact that the “bare patch” populations; *johnstoni* to the north and *bredoi* to the south, are separated by the “feathered” population. The altitudinal range of all the populations is similar: this bird generally occurs above c. 2,000 m (HBW), at times descending down to “6,500 feet” (Chapin

1939). Prigogine (1978) studied the range in Itombwe in detail and found that it occurred between 1,770 m and 2,750 m. The note Mutwanga "1,200 m" on the label of KMMA 71995 is suspicious, and we suppose the specimen was collected in fact above the village. Due to its stenotopy to high mountains, the subpopulations of this bird are, without doubt, not in regular contact and it is especially highly improbable that this would be the case for *johnstoni* and *bredoi*. With only the described morphological differences, there would thus be a good case, in order to avoid unnecessary splitting, to recognise just the two taxa: *johnstoni* (including *bredoi* as a synonym, although this is zoogeographical nonsense) and *kivuensis*. However, we consider the synonymizing of *bredoi* with *johnstoni* to be a premature action, because the colour of the bare skin round the eye in *bredoi* is unknown. It is yellowish distally and red proximally in *johnstoni* (see photograph in *HBW*), but it would be surprising if this colour (which is unknown at present and, given the difficulty of access of Mt. Kabobo, unlikely to be known in the near future) were the same in *bredoi*. According to Amadon & Short (1992), "presumed genetically separable" is a criterion that can be used to recognise subspecies and we concur in the present case. Therefore, we advocate the use of 3 subspecies in *Ruwenzorornis johnstoni*: nominate, *bredoi* and *kivuensis*.

TABLE 2
Statistical comparisons between populations of *Ruwenzorornis johnstoni*

	Nyungwe	<i>kivuensis</i> Virungas	Itombwe	<i>johnstoni</i>	<i>bredoi</i>
A. Wing ($F_{4,82}=12.1, ***$)					
<i>kivuensis</i>					
Nyungwe	—	NS	**	*	***
Virungas		—	NS	NS	***
Itombwe			—	NS	NS
<i>johnstoni</i>				—	*
B. Tail ($F_{4,85}=12.6, ***$)					
<i>kivuensis</i>					
Nyungwe	—	NS	**	***	***
Virungas		—	NS	*	**
Itombwe			—	NS	NS
<i>johnstoni</i>				—	NS
C. Culmen ($F_{4,93}=21.9, ***$)					
<i>kivuensis</i>					
Nyungwe	—	NS	NS	***	***
Virungas		—	NS	**	***
Itombwe			—	***	***
<i>johnstoni</i>				—	NS

(Bonferroni-compensated ANOVA contrasts: NS, not significant; * $p < 0.05$, ** $p < 0.001$, *** $p < 0.0001$)

In turacos, the advertising colours are highly variable (at species level). In the unrelated *Pica pica* (Corvidae), bare skin around the eye occurs in some geographically widely separate populations, and it is coloured differently (Lawton & Lawton 1986). This bare skin patch, which does not occur in the core population but is present in small isolates, is apparently a neotenic characteristic both in *Pica* and in *Ruwenzorornis*. Also, a detailed comparison of the eye patch may give a useful indication as to the validity of the genus *Ruwenzorornis*. Bare skin round the eye is present in the adult of the two *Musophaga* spp., and at most as a thin rim in the adult of the ten *Tauraco* spp. A study of the bare skin in the juvenile may be revealing in this context; the sole report for *Ruwenzorornis* (*vide* HBW) describes the juvenile with bare (blue) skin around the eye. If one considers the feathered condition in the adult as ancestral in *Ruwenzorornis*, “reverting” to a neotenic condition in small isolated populations, then the case for merging it with *Musophaga*, as advocated by BoA, is poor.

Acknowledgements

We are grateful to G. Lenglet and A. Cocriamont, KBIN at Brussels, for access to their collection, and to D. Turner, who commented on a previous draft of this paper. J. M. Lermould and D. Hancock confirmed the paucity of information on the young of the Ruwenzori Turaco.

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A new subspecies of Black and Yellow Silky Flycatcher, *Phainoptila melanoxantha*, from Costa Rica

by Gilbert Barrantes & Julio E. Sánchez

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The Black and Yellow Silky Flycatcher *Phainoptila melanoxantha*, (Ptilogonatidae) is endemic to the high mountains of southern Middle America (Slud 1964, Wolf 1976). The monotypic genus *Phainoptila* is atypical in external appearance and behaviour. Species of the other two genera (*Phainopepla* and *Ptilogonys*) of the family are crested and possess a very uniform plumage, characteristics absent in *P. melanoxantha*. Also, species of *Phainopepla* and *Ptilogonys* forage on the wing, capturing insects and plucking fruits, whereas *Phainoptila* picks berries from a perch (Stiles & Skutch 1989). Although the Black and Yellow Silky Flycatcher was considered to be restricted to the Cordilleras de Talamanca and Volcánica Central in Costa Rica and Cordillera Central in Panamá by Slud (1964), this species was later reported from the Cordillera de Tilarán (Law & Fogden 1981). In 1980, F. G. Stiles observed this species on Volcán Orosi, and in 1983 collected a specimen from Volcán Miravalles, in the Cordillera de Guanacaste the northernmost mountain range in Costa Rica. Stiles (in Phillips 1991) suggested that the population of the Cordillera de Guanacaste represented a new subspecies, but lacked sufficient material to describe it. Our observations and collections have overcome this difficulty and confirmed the distinctness of this northern form, which we describe herein.

In Costa Rica, the Black and Yellow Silky Flycatcher inhabits the highlands of the four mountain ranges (cf. Stiles & Skutch 1989). These cordilleras are separated by deep valleys, and extend from northwest to southeast along the longest axis of this country (Gómez 1986, Fig. 1). The Cordillera de Talamanca is the longest and highest of all four, with a dozen peaks above 3,000 m. The Cordillera Volcánica Central is 86 km long with an orientation from west to southeast and includes three peaks above 2,900 m. The Cordillera de Tilarán, 40 km long and with only one mountain above 1,800 m, is oriented from the north to southwest. These three cordilleras are of Tertiary age. Finally, the Cordillera de Guanacaste, which dates from the Quaternary (Castillo 1984), extends northwest for 80 km. This Cordillera comprises six isolated volcanic massifs. Since 1997, we have made several ascents to the upper part of different massifs of the four cordilleras to collect specimens of this bird.

In order to analyze the geographic variation of *P. melanoxantha*, G. B. collected specimens from Cerro Echandi, Villa Mills, Madre Selva (Cordillera de Talamanca, [Tal]), Volcán Barva (Cordillera Volcánica Central, [VCe]), Cerro Amigos (Cordillera de Tilarán, [Til]), Volcán Miravalles and Volcán Cacao (Cordillera de Guanacaste, [Gua]). These specimens, in addition to those already housed in the Museo de Zoología

at the Universidad de Costa Rica, allowed us to discern two types, one found in the Cordilleras de Talamanca and Volcánica Central, and the other, an undescribed subspecies, which occupies the Cordilleras de Tilarán and Guanacaste.

Phainoptila melanoxantha parkeri, new subspecies

Holotype. No. 3858 of the Museo de Zoología, Universidad de Costa Rica, an adult male collected at 1640 m on Volcán Cacao (10°58'50"N, 85°28'20"W, Provincia de Guanacaste) on 3 March 1997 by G. Barrantes.

Diagnosis. This form differs from populations of the Cordilleras de Talamanca and Volcánica Central by its completely yellow belly in males (as opposed to grey), and its shorter wing and tail (Fig. 2, Tables 1, 2) and, in females, the streaked pattern of the breast.

Description of the type. Head, throat, back, wings, and tail black (89, Jet Black, following Smithe 1974, 1981). Rump and the whole belly, including lower tail coverts yellow (near 55, Spectrum Yellow). Iris dull red, bill black, feet and tarsi black, and

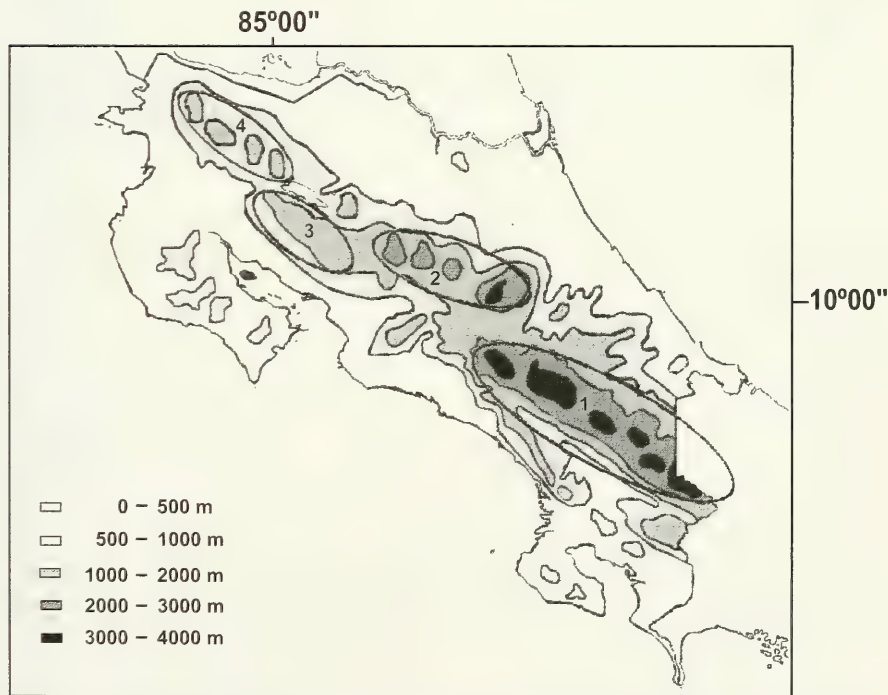


Figure 1. Geographic location of the four cordilleras in Costa Rica (1—Cordillera de Talamanca, 2—Cordillera Volcánica Central, 3—Cordillera de Tilarán, and 4—Cordillera de Guanacaste).

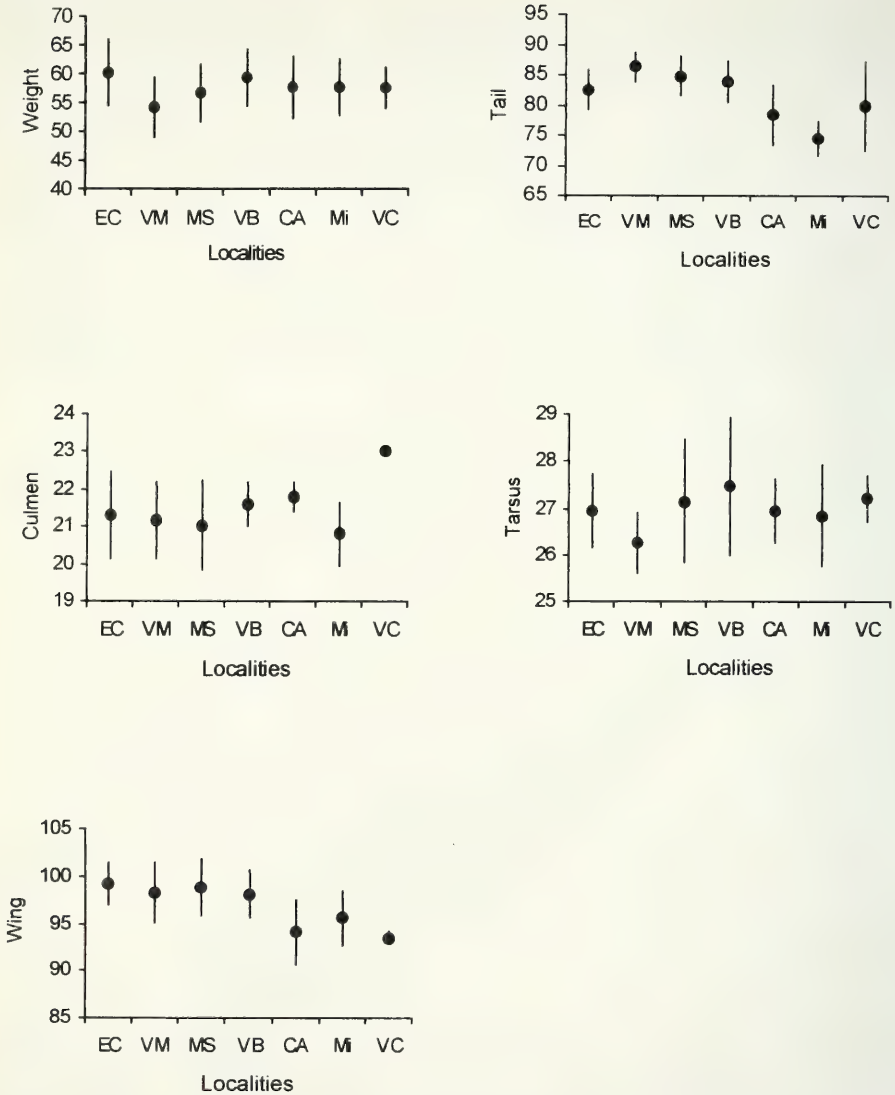


Figure 2. Measurements (average and standard deviation for males and females combined) of *Phainoptila melanoxantha* from seven localities arranged from southeast to northwest. Weight is given in g, the other variables in mm. Localities are: EC=Cerro Echandi; VM=Villa Mills; MS=Madre Selva; VB=Volcán Barva; CA=Cerro Amigos; Mi=Volcán Miravalles; and VC=Volcán Cacao.

sole yellowish. Weight 60.0 g, moderate fat. Culmen, 23.0 mm, wing (flattened) 94.0 mm, tail 85.0 mm, and tarsus 26.8 mm.

Variation. Eight males collected from Cerro Amigos (5, Til), and Volcán Miravalles (3, Gua) resemble closely the type in colour and measurements. Six females collected at the same localities (2 and 4 respectively) are all very much alike in colouration. They have the pileum black, hindneck dark neutral grey (84) shading to light neutral grey (85) on the face and throat. Back, rump, wings, and tail greenish-olive (49). The distal third of breast feathers are shaded from olive yellow (52) to yellow (55, Spectrum Yellow). This gives a pattern on the breast of faint yellowish streaks upon a greenish-olive background. The belly shades from neutral grey anteriorly to smoke grey posteriorly. Flanks and under tail coverts are yellow (55, Spectrum Yellow). For comparison of colour and measurements with females of the Cordilleras de Talamanca and Volcánica and Volcánica Central see Fig. 2 and Table 2.

Distribution. At present this form has been found at the Cordilleras de Tilarán and Guanacaste above 1550 m, including Volcán Orosí, the northernmost massif of this cordillera (Stiles pers. comm.). *Specimens examined.* Cerro Echandi (Tal): 2 males (UCR 3934, 3936), 3 females (UCR 3932, 3935, 3937); Villa Mills (Tal): 3 males (UCR 3896, 3909, 3924), 2 females (UCR 1999, 3910); Madre Selva (Tal): 6 males (UCR 3177, 3178, 3851, 3852, 3902, 3915), 3 females (UCR 3897, 3918, 3930); Volcán Barva (VCe): 6 males (UCR 3898, 3901, 3912, 3925, 3927, 3931), 3 females (UCR 3893, 3903, 3911); Cerro Amigos (Til): 3 males (UCR 3862, 3929, 3939), 2 females (UCR 3861, 3863); Volcán Miravalles (Gua): 3 males (UCR 3869, 3872, 3874), 4 females (UCR 3849, 3871, 3873, 3881); Volcán Cacao (Gua): 1 male (UCR 3858), 1 female (UCR 3854).

TABLE 1

Variation in colour between males of the two forms (Cordilleras de Talamanca/Volcánica Central and Cordilleras de Tilarán/Guanacaste) of *Phainoptila melanoxantha*

	Talamanca and Volcánica Central	Tilarán and Guanacaste
Head	Jet black (89).	Jet black.
Back	Jet black.	Jet black.
Wings	Jet black.	Jet black.
Tail	Jet black.	Jet black.
Rump	Spectrum yellow (55). A gradual transition band from olive-yellow (52) to spectrum yellow of about 1 cm is present on the upper rump.	Spectrum yellow. Transition band absent.
Breast	Citrine (51).	Citrine.
Sides and flanks	Citrine anteriorly and spectrum yellow (55) posteriorly.	Spectrum yellow.
Abdomen	Neutral grey (84).	Spectrum yellow.
Tail undercoverts	Citrine.	Spectrum yellow.

Parentheses enclose numerical code for Smithe's (1974) colour system.

Etymology. It is our pleasure to name this well defined subspecies for Theodore A. Parker III, not only in honour of his outstanding contribution to Neotropical ornithology but also for his great contribution to the conservation of our biodiversity.

Ecology

The habitat of *P. m. parkeri* is the elfin forest on steep slopes and ridges of the highest mountains of the Cordilleras de Tilarán and Guanacaste. This forest is dominated by *Clusia* sp (Clusiaceae), the only tree species that regularly attains a height over 5–6 m. Below this canopy layer and between *Clusia* trees a dense, even subcanopy 4–5 m high is formed by various tall shrubs and treelets, including *Blakea* sp, *Miconia* sp (Melastomataceae), *Schefflera* sp, *Oreopanax* sp (Araliaceae), *Geonoma* sp (Arecaceae), *Psychotria* spp, *Cosmibuena* (Rubiaceae), and *Rapanea* spp (Myrsinaceae) (Lawton 1980). The ground is often covered with a mat of roots and moss from which some herbs, such as *Heliconia* spp (Heliconiaceae), *Anthurium* spp (Araceae), and bromeliads, emerge. Although this habitat varies slightly in structure, it is very similar in vegetation composition to that occupied by the other populations of *P. melanozantha* at the Cordilleras Volcánica Central and Talamanca.

TABLE 2

Variation in colour between females of the two forms (Cordilleras de Talamanca/Volcánica Central and Cordilleras de Tilarán/Guanacaste) of *Phainoptila melanozantha*

	Talamanca and Volcánica Central	Tilarán and Guanacaste
Head	Pileum jet black. Hindneck dark neutral grey shading to light neutral grey on face and throat.	Pileum jet black. Hindneck dark neutral grey shading to light neutral grey (85) on face and throat.
Back	Greenish-olive (49).	Greenish-olive (49).
Rump	Greenish-olive.	Greenish-olive.
Breast	Greenish-olive.	Breast feathers shade from olive-yellow (52) to yellow (55, Spectrum yellow) distally, giving a pattern of faint yellowish streaks upon a greenish-olive background.
Wings	Greenish-olive.	Greenish-olive.
Tail	Greenish-olive.	Greenish-olive.
Sides and flanks	Citrine anteriorly and spectrum yellow posteriorly.	Citrine (51) anteriorly and spectrum yellow posteriorly.
Abdomen	Neutral grey (84).	Light neutral grey anteriorly, shading to smoke grey (45) posteriorly.
Lower tail coverts	Spectrum yellow.	Spectrum yellow.

The altitudinal distribution of *P. melanoxantha* varies with the height of the cordilleras and the distribution of the habitat occupied by this bird. The altitude and the habitat available for *Phainoptila* decrease from the Cordillera de Talamanca northward. Thus, the lower limit of distribution for the species is at c. 2,400 m, in the Cordillera de Talamanca, above 2,000 m in the Cordillera Volcánica Central, and 1,550 m on the Cordilleras de Tilarán and Guanacaste. Occasionally, a few individuals of this species move downslope, especially during the non-breeding season, to 1,800 m on the Cordilleras Volcánica Central and Talamanca; movements on other cordilleras are less extensive. *Phainoptila melanoxantha* is almost exclusively frugivorous. We analyzed stomach contents from 58 specimens collected throughout the geographic range and insect remains were found in only one of them. Even fledglings were fed with fruits (pers. obs.). The diet consists of at least 40 different fruit species, although birds showed a strong preference for fruits of *Schefflera* spp in all localities surveyed. Diet and preference for *Schefflera* spp are similar for both forms of *P. melanoxantha*.

Geographic variation in *Phainoptila melanoxantha*

Geographic variation in the colour pattern of *Phainoptila melanoxantha* indicates the existence of two well-defined forms (Tables 1, 2), one corresponding to the populations of the Cordilleras de Talamanca and Volcánica Central and the second to those populations that inhabit the Cordilleras de Tilarán and Guanacaste. The populations present at the Volcán Viejo and Cerro (volcano) Platanar, the nearest populations of the Cordillera Volcánica Central to the Cordillera de Tilarán, present the same colouration as other populations on that mountain range (pers. obs.).

We also compared five morphological features (weight, culmen, wing, tail, and tarsus) among different locations of *P. melanoxantha*. From these characters, tail and wing were significantly shorter for *P. m. parkeri* (One-way ANOVA. $p < 0.01$ in all cases). Overall, these analyses confirm the patterns displayed in Fig. 2, where it is shown that tail and wing of *P. m. parkeri* are shorter than those of populations from the Cordilleras de Talamanca and Volcánica Central.

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Observations on the birds of Cosmoledo Atoll, Seychelles

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Although Cosmoledo Atoll, Aldabra group, is recognized as an "Important Bird Area" by BirdLife International (Rocamora & Skerrett, in press), its avifauna has been poorly studied. Most published reports are based on short visits to only some of the more than 15 islands in the group (Fig. 1)—October 1878 (Rivers 1878), 9–12 October 1901 (H. A'C. Bergne, reported by Benson (1970)), 14–19 September 1907 (Dupont 1907), October 1937 (Vesey-Fitzgerald 1940, 1941), 5–6 October 1967 (Parker 1970), 6 March 1968 (Benson 1970), 6 March & 14 September 1968 (Bayne *et al.* 1970), 13 February 1970 (Gillham 1977), 12–13 April 1996 (Skerrett 1996). The total land area is approximately 5.2 km², or 3.4% of that of the whole atoll (Bayne *et al.* 1970). This remote atoll (Fig. 2) has been continuously exploited for birds, turtles, fish, and guano since at least the mid-1800s. The composition of the resident avifauna has been incompletely described in the literature, and the recent status of the various bird species is poorly documented. Our study reports observations we made during visits to the atoll on 7–13 December 1996 and 23–25 April 1997, discussed from the perspective of our collective long term residence on Cosmoledo (eight visits by JAM since 1981, including five months residence (January–May) in

1982 while studying sea turtles, and 10 years residence by AC since 1956 while working as fisherman and island manager). We focused particularly on the seabirds. Island names accord with those listed in the Constitution of the Republic of Seychelles (1992). In some cases, however, these differ from the more commonly used Kreol names or names found on older nautical charts (e.g. British Admiralty Chart 61301). To avoid confusion, all the names for each island are indicated in Fig. 1. The following accounts refer to species records from Cosmoledo Atoll unless stated otherwise.

AUDUBON'S SHEARWATER *Puffinus lherminieri*

In recent decades sometimes heard at night on Grand Ile and Menai (Bayne *et al.* 1970, AC pers. obs.), but not seen nesting. The possibility that it occurs on smaller islands, rarely visited at night, warrants investigation. This may have been the "Fouquet" reported by Rivers (1878).

RED-TAILED TROPICBIRD *Phaethon rubricauda*

Some 15 nests seen on Pti Astove on 25 April 1997. Also nests abundantly on other small rocky islets just east of Menai (including Ilot Lacroix, Ile aux Rats, Ile aux



Figure 1. Map of Cosmoledo Atoll. All known names for each island are indicated, with the first being the official name recorded in the Constitution of the Republic of Seychelles (1992) or, for islands not listed in the Constitution, the most commonly used vernacular name. Alternate names are denoted by parenthesis; Kreol names are in italics.

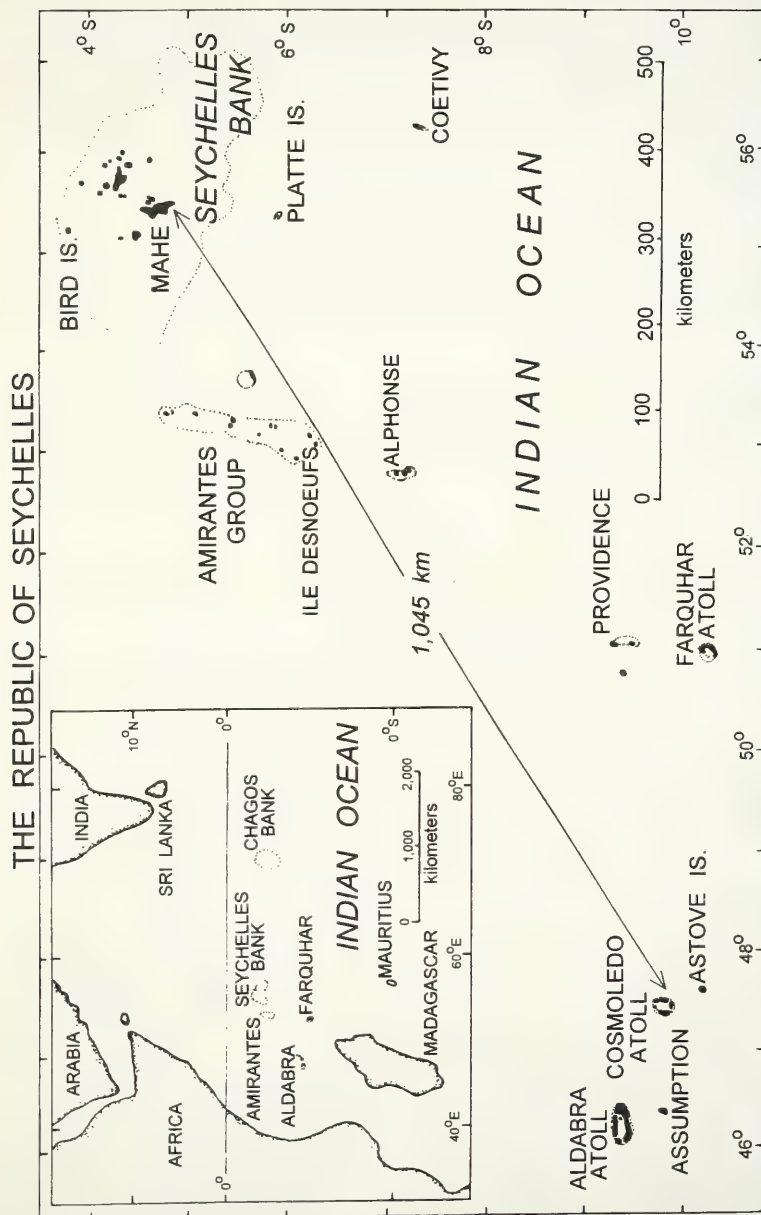


Figure 2. Map of the Republic of Seychelles showing its position in the Indian Ocean, and the location of Cosmoledo Atoll relative to Mahe (the most populated island) and other important islands of Seychelles.

Macaque, and Ile L'Anse (Skerrett 1996)), regularly on Grand Ile (where their offspring are killed by cats), and less abundantly on Pagode (Gillham 1977), Ile du Nord, Ile Nord-Est and Grand Polyte islands. Nesting first reported by Vesey-Fitzgerald (1941).

WHITE-TAILED TROPICBIRD *Phaethon lepturus*

No nesting records, but individual sightings by Bayne *et al.* (1970) and Skerrett (1996).

MASKED OR BLUE-FACED BOOBY *Sula dactylatra*

Nesting birds with eggs (usually 1–2 per nest, but one with 3), as well as chicks of all sizes, including some larger than the parents, were recorded by us in December 1996. Nesting was most concentrated on Ile du Sud-Ouest and Pagode, less so at Goëlettes, Ile Nord-Est, and Ile du Nord (occurring mostly at the north and south ends of that island), and scarce or lacking at Grand Polyte, Petit Polyte, Grand Ile, Ile du Trou, Ile aux Chauve-Souris, and Menai. In contrast, Diamond (in Bayne *et al.* 1970) counted >200 pairs of *S. dactylatra* nesting on Grand Ile in March 1968. In April 1996, Skerrett estimated a total of 5,000–6,000 breeding pairs on the atoll (Rocamora & Skerrett in press) with 5,000 on Ile du Sud-Ouest, 300 on Pagode, 100 on Goëlettes and 30 on Ile du Trou (Skerrett 1996). Previous Cosmoledo records include those by Vesey-Fitzgerald (1941), Parker (1970), and Gillham (1977). *S. dactylatra* was probably one of the three (unidentified) species of booby noted by Rivers (1878).

RED-FOOTED BOOBY *Sula sula*

This, the most abundant booby species, was nesting in December 1996 in greatest density on Ile du Sud-Ouest, Pagode, Ile du Trou, and Sousouri. Scattered nesting occurred on Menai (in the mangroves), Ile du Nord, and Goëlettes, but was notably sparse on Grand Polyte and Petit Polyte, where it had been dense in 1982 (JAM and AC pers. obs.). As in 1982, we found no nesting on Grand Ile or Ile Moustique. In contrast, in March 1968, Bayne *et al.* (1970) reported “well in excess of 150 pairs” on Grand Ile. During his visit on 12–13 April 1996, Skerrett estimated total breeding pairs on the atoll to number some 10,000–12,000 (Rocamora & Skerrett in press) with 10,000 on Ile du Sud-Ouest, 500 on Pagode, 500 on Ile du Nord, 300 on Ile Nord-Est, and 200 on Goëlettes. *S. sula* was previously reported by Vesey-Fitzgerald (1941), Parker (1970), and Gillham (1977), and is probably one of the three types of booby mentioned by Rivers (1878).

BROWN BOOBY *Sula leucogaster*

No reliable published accounts could be found of this species at Cosmoledo. In December 1996, we observed nesting on Ile du Nord (two adults and a juvenile), and on Ile du Sud-Ouest (five adults, a small white chick, and one juvenile). During the past three decades nesting was also seen at Pagode, Goëlettes, and Ile Nord-Est, but not on the other islands (Menai, Ile aux Chauve-Souris, Grand Polyte, Petit Polyte,

Grand Ile, or Ile du Trou) (AC per. obs.). The species was more abundant in the past, but has always been relatively rare (AC pers. obs.). The reference to a collected specimen in both Bayne *et al.* (1970) and Parker (1970) was in fact a misidentified immature *S. dactylatra* (Diamond 1981). River's (1878) account does not clearly identify *S. leucogaster* as one of the three booby species he reported, which led Diamond (1981) to suggest that he may have either confused immature *S. dactylatra* with a third species of booby, or sighted the Abbott's Booby *Sula abbotti*, formerly known to occur on Assumption (Fig. 2).

GREAT FRIGATEBIRD *Fregata minor* and **LESSER FRIGATEBIRD** *F. ariel*
Both *F. minor* and *F. ariel* occur in relatively large numbers (at least several hundred birds) and kleptoparasitise food from the boobies. Gillham (1977) reported *F. minor* as most abundant. Vesey-Fitzgerald (1941) reported nesting by both species on islets in the lagoon. In December 1996, we surveyed all the islands on the north, east and south sides of the atoll but encountered breeding only on Ile du Sud-Ouest where we found a half dozen nests containing juveniles, later identified from our photographs as *F. minor* by A. Skerrett. We did not, however, visit the mangroves on Menai where significant numbers of frigatebirds used to nest (AC pers. obs.). The current status of both the Menai rookery and *F. ariel* is therefore unknown.

CATTLE EGRET *Bubulcus ibis*

Encountered by us on most islands in December 1996, it was also reported by Benson (1970), Parker (1970), Bayne *et al.* (1970), Gillham (1977), and Skerrett (1996).

GREEN-BACKED HERON *Butorides striatus*

Reported by Benson (1970), Parker (1970), Bayne *et al.* (1970), Gillham (1977), and Skerrett (1996).

DIMORPHIC EGRET *Egretta dimorpha*

Encountered by us at most islands and along the perimeter of the lagoon during all seasons; also reported by Parker (1970), Benson (1970), Bayne *et al.* (1970), Gillham (1977), and Skerrett (1996).

GREY HERON *Ardea cinerea*

Nests most abundantly at Ile aux Moustiques, but also on all the islets north of Menai, on Ile du Nord, Ile Nord-Est, Ile du Trou, and Petit Polyte (AC pers. obs.), as well as at Ile Goëlettes (Skerrett 1996) and Ile du Sud-Ouest (Skerrett, pers. comm.). Earlier sightings were made by Parker (1970), Bayne *et al.* (1970), and Gillham (1977).

WHITE-THROATED RAIL *Dryolimnas cuvieri*

The species was first recorded in 1878 by Rivers (1878), and last sighted in 1907 at Ile du Sud-Ouest by Dupont (as reported by Benson (1970)). Extinction was confirmed in 1981 (Mortimer 1984b).

CRAB PLOVER *Dromas ardeola*

We observed large flocks numbering some 500 birds at the perimeter of the lagoon in December 1996. Other sightings reported by Dupont (1907), Parker (1970), Benson (1970), Gillham (1977).

GREY PLOVER *Pluvialis squatarola*

Reported by Parker (1970), Benson (1970) and Skerrett (1996).

LESSER SANDPLOVER *Charadrius mongolus*

Recorded in April 1996 by A. Skerrett (pers. comm.).

GREATER SANDPLOVER *Charadrius leschenaultii*

Reported by Parker (1970), Benson (1970), Gillham (1977), and Skerrett (1996).

BAR-TAILED GODWIT *Limosa lapponica*

Reported by Benson (1970).

WHIMBREL *Numenius phaeopus*

Reported by Parker (1970), Benson (1970), Gillham (1977) and Skerrett (1996).

SLENDER-BILLED CURLEW *Numenius tenuirostris*

Reported by Gretton (1991).

GREENSHANK *Tringa nebularia*

Reported by Benson (1970).

COMMON SANDPIPER *Actitis hypoleucos*

Recorded by Dupont (1907) and Parker (1970).

TURNSTONE *Arenaria interpres*

Regularly encountered in December 1996 along all shorelines, it was also reported by Dupont (1907), Parker (1970), Benson (1970), Gillham (1977), and Skerrett (1996).

SANDERLING *Calidris alba*

Reported by Parker (1970), Benson (1970), Gillham (1977), and Skerrett (1996).

CURLEW SANDPIPER *Calidris ferruginea*

Reported by Parker (1970), Benson (1970), and Gillham (1977).

CASPIAN TERN *Hydroprogne caspia*

Regularly seen feeding in shallow water in December 1996; also reported by Vesey-Fitzgerald (1941). The possibility that it breeds at Cosmoledo as on neighbouring Aldabra (Diamond & Prýs-Jones 1986) warrants investigation.

BLACK-NAPED TERN *Sterna sumatrana*

Regularly encountered along shorelines in December 1996; previously reported by Bayne *et al.* (1970), Gillham (1977) and Skerrett (1996). May breed at Cosmoledo (A. Skerrett 1996) as on Aldabra (Diamond & Prÿs-Jones 1986).

BRIDLED TERN *Sterna anaethetus*

Several adults seen on two small islets along north-west coast of Ile du Sud-Ouest (in December 1996), also on islets near Ile aux Moustiques where nesting was observed (by AC) in the late 1980s. Rivers (1878) reported its occurrence in 1878. Vesey-Fitzgerald (1941) reported eggs on lagoon islets in October 1937.

SOOTY TERN *Sterna fuscata*

Nests annually in large numbers over most of Grand Ile, but especially on the flat sandy plain, during the south-east monsoon. The nesting season, usually June to August, is consistent with that documented for *S. fuscata* elsewhere in Seychelles (see review by Diamond & Prÿs-Jones (1986)). During his brief visit to Grand Ile in 1967, Parker (1970) observed that all the young birds had fledged by 5 October. In December 1996, we found carcasses of dead *S. fuscata* from the 1996 nesting season, but no live birds.

Although residents of the atoll have annually (during periods of human occupation) collected many hundreds of eggs for local consumption, the distance between Cosmoledo and Mahe precluded the import of large quantities of fresh eggs to Mahe from the atoll. Thus, no records were kept of egg production. In fact, fresh eggs were systematically harvested for export to Mahe during only two seasons (1990 and 1991) (Justin Moutache (IDC) pers. comm.). During those seasons a reserve from which no eggs were harvested was established in the sand dunes of Grand Ile (E. G. Smith *in litt.* to C. Feare, 6 March 1991; N. J. Shah *in litt.* to P. Mathiot, 24 June 1991), and the breeding population comprised an estimated two million birds (E. G. Smith *in litt.* to C. Feare, 6 March 1991). This figure was corroborated by egg collectors (AC and Peter Volcere, pers. comm.) who, having harvested eggs at both sites, agreed that the breeding population on Cosmoledo was more than twice that of Desnoeufts, which has been estimated by Feare & Gill (1996) to number some 360,000 to 500,000 birds. [Note: although a copy of the 6 March 1991 letter is on file in Seychelles, the original letter never reached C. Feare.] The information gathered in 1990–91 thus indicates a population two orders of magnitude greater than previously thought (Diamond & Prÿs-Jones 1986). In fact, the Grand Ile rookery has never been visited by an ornithologist during the nesting season, and earlier reports of nesting (Rivers 1878, Vesey-Fitzgerald 1941) do not mention rookery size.

During the 1920s and 1930s, yolk from millions of eggs was barrelled each year (using salt or boric acid as a preservative) and exported from Seychelles to Europe and America. An unknown proportion of those eggs came from Cosmoledo which was leased by the same individual who controlled the egg harvest in the Amirantes (Ridley & Percy 1958). Feare (1976) has suggested that eggs barrelled on the remote

atolls of Cosmoledo and Farquhar may have contributed significantly to the huge egg crop of the 1920s and 1930s reported by Ridley & Percy (1958).

LITTLE TERN *Sterna albifrons*

Reported by Bayne *et al.* (1970).

CRESTED TERN *Thalasseus bergii*

Encountered on numerous occasions in December 1996 standing on sand banks and shallow water along shorelines. It was also reported by Parker (1970), Gillham (1977), and Skerrett (1996). May breed on Cosmoledo (Skerrett 1996) as on Aldabra (Diamond and Pr ys-Jones 1986).

BROWN NODDY *Anous stolidus*

Nests regularly at Ile du Sud-Ouest (AC pers. obs.), where Skerrett (1996) found 20 pairs with eggs in April, and JAM recorded more than 100 adults on a limestone shelf on the north shore in late January 1982. Vesey-Fitzgerald (1941) reported nesting on islets in the lagoon, and claimed that in much of Seychelles breeding occurs year-round, with a peak during the south east monsoon (April–October) which coincides with peak nesting by *S. fuscata*. Elsewhere, the two species often share a rookery, with *A. stolidus* occupying the perimeter of the closely packed *S. fuscata* colonies but not at Cosmoledo (A.C.). At Aldabra, where *S. fuscata* does not nest, Diamond & Pr ys-Jones (1986) reported that most egg-laying by *A. stolidus* occurs between September and March, and rarely in other months. Occurrence at Cosmoledo was also reported by Parker (1970).

WHITE TERN *Gygis alba*

At least eight birds recorded by JAM on Ile du Sud-Ouest in January 1982; also reported by Parker (1970) and Benson (1970).

MADAGASCAR TURTLE DOVE *Streptopelia picturata*

First reported in 1878 by Rivers (1878), and later by Bergne in 1901 (see Benson 1970), it was last seen by Dupont (1907) in 1907 and was presumed extinct by Benson (1970). In 1982, a population, apparently *S. p. coppingeri* as on Aldabra, was rediscovered on Ile du Sud-Ouest by Mortimer (1984b). We found the species to be more widespread on that island in December 1996 than was previously reported by Mortimer. Nevertheless, it is apparently restricted to Ile du Sud-Ouest, despite efforts by the junior author (AC) to introduce trapped specimens to Menai in the late 1980s.

BARRED GROUND DOVE *Geopelia striata*

Reported by Benson (1970) and Bayne *et al.* (1970).

BLUE PIGEON *Alectroenas sp.*

The “*Pigeon hollandais*” reported by Rivers (1878) at both Astove and Cosmoledo atolls was probably an *Alectroenas*, possibly *A. sganzini* which still occurs at Aldabra.

With no subsequent sightings on record the populations at both Astove and Cosmoledo are probably extinct along with another *Alectroenas* that previously inhabited Farquhar (Stoddart & Benson 1970).

MADAGASCAR COUCAL *Centropus toulou?*

Rivers (1878) reported a coucal, possibly *C. toulou* as on Aldabra. But with no subsequent sightings, it is presumed extinct.

BLUE-CHEEKED BEE-EATER *Merops superciliosus*

Single birds seen by Gaymer in 1964 and 1965 (reported by Benson (1970)).

BROAD-BILLED ROLLER *Eurystomus glaucurus*

One bird reported by Vesey-Fitzgerald (1940).

MADAGASCAR BULBUL *Hypsipetes madagascariensis?*

Rivers (1878) reported a bulbul, possibly *H. madagascariensis* as on Aldabra. But with no subsequent sightings it is presumed extinct.

RED-BACKED SHRIKE *Lanius collurio*

One bird reported by Benson (1970).

MADAGASCAR CISTICOLA *Cisticola cherina*

Very abundant, its occurrence has been documented by Vesey-Fitzgerald (1940), Benson (1970), Parker (1970), Gillham (1977), and Skerrett (1996).

SOUMANGA SUNBIRD *Nectarinia souimanga buchenorum*

Its occurrence is described by Rivers (1878), Vesey-Fitzgerald (1940), Benson (1970), Parker (1970), Gillham (1977), and Skerrett (1996). Sinclair & Langrand (1998) consider the Cosmoledo population a race of Abbott's Sunbird (*N. abbotti buchenorum*).

MADAGASCAR WHITE-EYE *Zosterops maderaspatana menaiensis*

Reports on the species, which is found on Menai, include those by Vesey-Fitzgerald (1940), Benson (1970), Bayne *et al.* (1970), and Skerrett (1996).

RED-HEADED FOREST FODY *Foudia eminentissima*

Diamond (1981) believes this to be the fody reported by Rivers (1878) on Astove, Cosmoledo, and Assumption in 1878. It still occurs on Aldabra, Comores, and Madagascar (Benson 1967) but is probably extinct at the other localities.

PIED CROW *Corvus albus*

Occurs in small numbers at Cosmoledo, nesting on Menai in the mangroves and on Ile du Nord in Casuarina *Casuarina equisetifolia*. Early reports of its existence on Cosmoledo in 1878 (Rivers 1878) and on Astove atoll in 1836 (Stirling 1843) indicate

that it arrived without human assistance. Moreover, is known to have subsequently gone extinct on Astove and later to be seen recolonizing unaided (Pryŕ-Jones *et al.*, 1981). Other reports on Cosmoledo include Vesey-Fitzgerald (1940), Benson (1970), Parker (1970), Bayne *et al.* (1970), and Skerrett (1996).

Human impacts

Since the mid-1800s Cosmoledo has been exploited for fish, turtles, sea birds, and molluscs, with up to four human settlements operating at a time (two on Menai and fishing camps on Grand Ile, Grand Polyte, and Ile du Sud-Ouest). Census statistics (Seychelles National Archives) record populations of <10 men during 1850–1900, and 8–58 people (28% women) during this century. Since 1980, the atoll has been owned and operated by the parastatal company, Islands Development Company (IDC). IDC installed a cold store on Grand Ile in the late 1980s to facilitate collection of Sooty Tern eggs for shipment to Mahe; however, the venture proved unprofitable, due to the expense of travelling the 1,045 km between Cosmoledo and Mahe and to breakage of eggs in the rough seas of the south east monsoon. IDC withdrew its personnel from Cosmoledo in 1992. Unfortunately, since then, the atoll has suffered incursions by unauthorized fishing vessels from Seychelles and Madagascar which harvest turtles, birds, sharks, reef fishes and sea cucumbers (JAM and AC, pers. obs.)

Feral cats were reported on Grand Ile by Bayne *et al.* (1970) where Gillham (1977) found them to be serious predators of *S. dactylatra*. In the early 1980s, cats were present on both Grand Ile and Menai. Rumours that they have since spread to Grand Polyte are supported by the decline in numbers of nesting boobies that we observed on Grand Polyte between 1982 and 1996. Rabbits were introduced to several of the smaller islands prior to 1907 (Thomasset 1907) and to Menai in the mid-1980s by AC. They still occur at least on Ile du Sud-Ouest and Menai. Rats (*Rattus* sp.), present on many islands in the group including Grand Polyte, Grand Ile and Menai, but not Ile du Sud-Ouest (AC pers. obs.), appear to be of the same species (*Rattus rattus*) that occurs on Aldabra, but their identity needs verification. Goats (*Capra hircus*) were introduced during the 1800s (Thomasset 1907), still occurred on Ile Nord-Est as late as 1960 (Piggott 1969) but no longer occur. Some of the pigs (*Sus domesticus*) released on Menai in 1986 were still alive in 1997, having survived on a diet of turtle eggs (JAM pers. obs.) and mangrove crabs (AC pers. obs.). Earlier this century, guano was collected from the west end of Ile du Sud-Ouest, and from Ile du Nord and Ile Nord-Est. In 1901, H.A'C. Bergne estimated that 120 tonnes had been removed from Ile Nord-Est and that 300–400 tonnes remained (in Bayne *et al.* 1970).

In the early 1980s, the resident fishermen took juvenile Red-footed Boobies for food on rare occasions (JAM pers. obs.), using sticks to knock them off their roosts. More commonly, however, they would harass Masked Boobies on the ground in much the same way the frigatebirds do in the air. By running noisily through the rookery early in the morning, the fishermen frightened the birds into disgorging their

last meal (flying fish, squid, and other small fishes) which they collected for use as fishing bait—a practice first reported by Vesey-Fitzgerald (1941). The crews of unauthorized fishing boats appear to be more destructive. In December 1996, we found several recently killed *S. sula* on the beaches of Grand Ile and Grand Polyte; ten years earlier, AC found a sack containing some 40 dead *S. sula*.

Management Recommendations

Although some of its bird populations have suffered declines, Cosmoledo certainly has the largest remaining colonies of *Sula dactylatra*, and possibly also *Sula sula* remaining in the Indian Ocean (Feare 1984, Rocamora & Skerrett in press). Those on Ile du Sud-Ouest have been particularly well preserved, perhaps due to the rough terrain of that island and the lack of rats. We consider its terrain, which comprises uplifted coral limestone almost unweathered in appearance, to be the most difficult for walking of any in the outer islands—a sentiment shared by Piggott (1969). In addition to its extraordinary bird populations, the atoll hosts the second largest Green Turtle *Chelonia mydas* nesting population in Seychelles after Aldabra (Mortimer, 1984a), a significant Hawksbill Turtle *Eretmochelys imbricata* rookery, important foraging habitat for both Green Turtles and Hawksbills, and exceptional coral reefs fringing the outside of the atoll. We believe that Cosmoledo would best be managed as a nature reserve, a view previously expressed by Piggott (1969), Gillham (1977), and Skerrett (1996). In fact, in the late 1960's, when the lease for Aldabra was passed to the Royal Society, Christopher Cadbury offered to buy Cosmoledo (which came up for sale) on behalf of the international conservation community (Skerrett 1996). To discourage poaching of birds, turtles and other marine life, however, personnel would need to be permanently stationed on the atoll. This would be prohibitively expensive given the isolation from both Mahe and Aldabra, and these anticipated costs undermined general support for Mr Cadbury's offer. Nevertheless, the atoll also has the potential to serve as a spectacular dive destination and tourist attraction, the operation of which (if handled properly) might defray some of the costs involved in protecting the wildlife. Eradication of cats and rats could be easily achieved given the limited land area, and can be expected to benefit the bird populations.

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An erythristic Yellow-billed Parrot *Amazona collaria*

by Herlitz Davis & Bernard Zonfrillo

Received 28 November 1998

Adult parrots of the Genus *Amazona* generally have green body, wings and mantle, but many species have markings of other primary colours, usually confined to tracts of the wing, tail or head. Two species of mainly green *Amazona* parrot occur in Jamaica: the Black-billed Parrot *Amazona agilis* has two red wing feathers, and the Yellow-billed Parrot *Amazona collaria* is variably rose-coloured on the neck and chin, with yellow flashes to the wings and tail. Other nearby Caribbean *Amazona* parrots are similarly green, with those from Mexico, Cuba and Puerto Rico having small amounts of red on the head or wings. Colour morphs of various types are not uncommon in parrots but none is recorded from Jamaica (Gosse 1847, Forshaw & Cooper 1978, Downer & Sutton 1992).

On 25 November 1997 we observed a largely red *Amazona* parrot amongst a flock of c. 30 Yellow-billed Parrots at Millbank, in the Rio Grande valley of eastern Jamaica. The bird was strikingly red—similar in intensity to that of the Scarlet Macaw *Ara macao*. The parrot, observed at distances of 35 to 200 m, was identical in general shape, size and behaviour to nearby *A. collaria* with which it associated. The head, neck, breast and mantle were vivid scarlet as were the lesser wing coverts. The median wing coverts were deep orange-yellow and the flight feathers were blue-green as in normal *A. collaria*. The lower back and tail were normal green-blue colouration and the bill was yellowish. The bird was photographed.

Local citrus farmers informed us that they had from time to time seen red parrots flying around in the area but that they were not common. HD spends many days annually in the field tracking Yellow-billed Parrots as part of a scientific study of this species but had never encountered an erythristic bird until this observation. The *A. collaria* population of eastern Jamaica thus appears to have a rare erythristic variant, of which this is the first description.

Acknowledgements

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A new genus for the Kerguelen Petrel

by Storrs L. Olson

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The Kerguelen Petrel (*Pterodroma brevirostris* auct.) is an inhabitant of stormy southern seas, breeding at the islands of Kerguelen, Crozet, Marion, Tristan da Cunha, and Gough. Like the bird itself, its specific and generic nomenclature has been through some rough weather. The Kerguelen Petrel was long placed among the gadfly petrels of the genus *Pterodroma* (formerly *Aestrelata* or *Oestrelata*). Imber (1985) used characters of the upper intestine, supplemented with data from Mallophaga and behavioural traits, to show that the Kerguelen Petrel was not closely related to *Pterodroma*. He resurrected Mathews' (1942) name *Lugensa* for it and placed it among the fulmarine petrels, a treatment that has had influential followers (e.g. Sibley & Monroe 1990).

Imber's observations were preceded by those of Harper (1973) who noted major differences between skulls of the Kerguelen Petrel and *Pterodroma mollis*, which, along with *P. inexpectata* and *P. ultima*, had been thought to be a close ally (Jouanin & Mougin, 1979). My own examination of skeletons of the Kerguelen Petrel showed this species to be very different from all available taxa of *Pterodroma*, and more similar to fulmarines in certain characters, such as in the configuration of the distal end of the humerus. On the basis of mitochondrial DNA sequences, Nunn (1994) reported the Kerguelen Petrel to be a fulmarine and not part of the genus *Pterodroma*. He referred it to the genus *Lugensa*. In a subsequent phylogeny based on the same kinds of data (Nunn & Stanley 1998), *Lugensa* was still separated from *Pterodroma* but was placed nearer the shearwaters (*Puffinus* and *Calonectris*). In any case, the consensus is that the Kerguelen Petrel is a distinct generic entity that is not particularly closely related to *Pterodroma*.

The specific name used for the Kerguelen Petrel was long the subject of contention, particularly as concerns the epithet *Procellaria lugens* attributed to Kuhl (1820). The issue is complex and the details unimportant to the basic theme of this note and so are best summarized. Kuhl (1820: 144) made reference to a specimen from the Atlantic Ocean once in the possession of J. R. Forster, to another specimen of a smallish petrel in his possession since lost, and to what he referred to as *Procellaria lugens* Banks (and on page 145 as *Proc. lugens* Forst.) based on two drawings by Sidney Parkinson from James Cook's first expedition. All of these he listed erroneously under the name "*Proc. grisea* L.", which we now know to refer to the Sooty Shearwater *Puffinus griseus* (Gmelin). Thus, although the name *P. lugens* first saw publication in Kuhl, it was simply proposed as a synonym.

Bourne & Elliott (1965) determined that the Parkinson drawings were of the species now known as *Pterodroma inexpectata* Forster (1844). They also considered that Kuhl's description of the specimen now lost could not be identified, from which they concluded that the name *lugens* should "perhaps best be written off as indeterminable". Since then it has been consigned to oblivion. I cannot see in any

case that the name *lugens* can be attached to the specimen that Kuhl was attempting to describe. Thus *P. lugens* must either be regarded as a synonym of *Procellaria grisea* Gmelin or as an earlier name for *P. inexpectata* Forster (1844). Regardless, the name *lugens*, expunged by Bourne & Elliott (1965), cannot pertain to the Kerguelen Petrel. This conclusion has major consequences for the generic name *Lugensa*.

The entire text for Mathews' (1942) new subgenus *Lugensa* is as follows:

The Short-billed Petrel, formerly called Pterodroma brevirostris, now known as P. lugens of Kuhl 1820, has the bill very much compressed on the sides. That character is shared by no other species of Pterodromine Petrel and it can be made a diagnostic character for a new subgenus Lugensa and be known as Pterodroma (Lugensa) lugens (Kuhl 1820). As far as Mathews was concerned, there was only a single species in his new subgenus, that being *Procellaria lugens* Kuhl (1820), which must, therefore, be the type of the genus. It is quite irrelevant that Mathews "also mentioned the alternative name *P. brevirostris*" (Imber 1985: 215), because he regarded that name to be a junior synonym of *lugens*. Shortly thereafter, Mathews came to regard *P. brevirostris* as an earlier name for the Mascarene species *P. aterrima* Bonaparte and affirmed that his *Lugensa* had as "orthotype *Procellaria* [sic] *lugens* Kuhl 1820" (Mathews & Hallstrom 1943: 8).

It can only follow that if the specific name *lugens* Kuhl cannot be identified with the Kerguelen Petrel, as concluded by Bourne & Elliott (1965), then the generic name *Lugensa* automatically follows it onto the rubbish heap of nomenclature. The only alternative would be to attach the name *lugens* to the species now known as *Pterodroma inexpectata*, in which case *Lugensa* would become a synonym of *Pterodroma*. Because either action leaves the Kerguelen Petrel without a generic name, I propose the following.

***Aphrodroma*, new genus**

Type-species. Oestrelata kidderi Coues (1875a,b). The holotype of this species (USNM 68970) is an undisputed example of Kerguelen Petrel, an adult male taken on 22 Oct 1874 on Kerguelen Island by J. H. Kidder (Deignan 1961: 12). The selection of *O. kidderi* as the type species of *Aphrodroma* insures that the generic name will always attach to the organism intended to be distinguished. The putative holotype of *Procellaria brevirostris* Lesson (1831) is a "battered" (Bourne 1957: 185, footnote) specimen in the Paris Museum collected by Delalande in 1820, supposedly at the Cape of Good Hope (Mathews & Hallstrom 1943). Brooke (1981) found "no reason to doubt the provenance of the type specimen", although the species is only a rare vagrant in South African waters (Maclean 1985). Doubts have been expressed both that this is the type of Lesson's name (there being discrepancies between it and Lesson's description—see Elliott 1957: 565) and that the specimen is correctly identified as a Kerguelen Petrel. Current usage follows the assessments of Bourne & Elliott (1965), aided by C. Jouanin (in Elliott 1957, and Bourne & Elliott 1965), that this is Lesson's type and that it is a Kerguelen Petrel. If so, then the species may now

be known as *Aphrodroma brevirostris* (Lesson). Should the identity of the Paris specimen, or its status as a type, be revised, the genus would remain the same and the Kerguelen Petrel would then be known as *Aphrodroma kidderi* (Coues).

Etymology: Gr. *aphros*, foam, froth, and *dromos*, running, from the habitat of the species in stormy seas. The name is feminine in gender.

Diagnosis. See the diagnosis of Imber (1985: 215) for his *Lugensa*, to which may be added the cranial characters mentioned by Harper (1973).

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Yellow-throated Oriole, *Icterus xantholaemus* Gil 1918, a non-valid species

by Josefina Barreiro & Jaime Pérez del Val

Received 25 February 1999

While updating the bird collection of the Museo Nacional de Ciencias Naturales (MNCN) in Madrid, Spain, the type specimen of the Yellow-throated Oriole *Icterus xantholaemus* was examined. This species, described by Gil Lletget (1918), was only known from this specimen (Peters 1968, Sibley & Monroe 1990) and special care was taken to check the capture data and to compare the specimen with allied species, since its status remained doubtful.

Peters (1968) and Howard & Moore (1991) accepted the Yellow-throated Oriole but Peters doubted its validity because only the type specimen had been found. Similarly, Sibley & Monroe (1990) did not check the specimen but speculated that it "may be an immature of *I. mesomelas* or possibly a hybrid of unknown parentage".

The type specimen (MNCN 8002) clearly shows the distinctive features of the male of Saffron-cowled Blackbird *Xanthopsar flavus*: head, lesser wing-coverts, rump band, flanks and underparts golden yellow; tibial feathers, lores, nape and rest of upperparts black (see Ridgely & Tudor 1989). The measurements taken (bill 21, wing 104, tail 79, tarsus 25.5 mm) also fall within those reported from eight males of *X. flavus* kept at the Museo Nacional de Historia Natural of Montevideo (bill 20.1–26, $\bar{x}$ =22, wing 102.5–112.3, $\bar{x}$ =106.7, tail 71.9–83.6, $\bar{x}$ =78.9, tarsus 24.6–26.7, $\bar{x}$ =25.6 mm) (Cuello *in litt.* 1998).

Astonishingly, the specimen from which Gil Lletget described the Yellow-throated Oriole was collected in Ecuador, more than 3,000 km northwest of the known range of the Saffron-cowled Blackbird (south Paraguay, south Brazil, Uruguay and the northeast of Argentina). However the specimen has two old labels. On one of them appears in print: "*América. Ecuador. Colección de Manuel Villavicencio. No.*" with the number "3" written in ink. From this information, Gil Lletget (1918) noted Ecuador as terra typica and Manuel Villavicencio as collector. The other label is hand written: "*Sur de Brasil*". This latter is exactly like those used by the naturalist Manuel Jiménez de la Espada, a member of the *Expedición al Pacífico 1862–1865* (Puig-Samper 1988) who reports the purchase in Quito of a bird collection from Mr Villavicencio (*Catálogo de la aves recogidas por Don Marcos Jiménez de la Espada de Noviembre 1864 a Octubre 1865*. Unpublished hand written catalogue. Archives of the MNCN of Madrid). Villavicencio's collection was accompanied by a numbered list, which is missing. Jiménez de la Espada might have written *Sur de Brasil* as the

locality of capture, based on this list, which would fit with the known range of the Saffron-cowled Blackbird.

In the light of this information, it appears that the bird was probably misidentified by Gil Lletget and the validity of *Icterus xantholaemus* Gil 1918 should therefore be rejected, when it becomes a synonym of *Xanthopsar flavus* (Gmelin 1788).

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We are grateful to Juan P. Cuello, curator of the bird collection at the Museo Nacional of Montevideo for providing us with the measurements of *Xanthopsar flavus*. Alan Tye greatly improved the English version of this manuscript and Alvaro Jaramillo pointed out some errors on the *X. flavus* description. This work was in part supported by a Comunidad Autónoma of Madrid Fellowship (08/231/96) to the second author.

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Shape of avian eggs: a response to Barta and Székely

by Michael Walters

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Barta & Székely (1997) examined the shapes of avian eggs and made predictions on the expected shape for clutches of varying size, based on mathematical calculations relating to efficient incubation. They predict that:

1. The optimum shape for a one-egg clutch is spherical.
2. For a two or three egg clutch it is biconical.
3. For four eggs, the shape should be conical (pointed).
4. In clutches of over five/seven eggs it should again be spherical (the text says five, but the summary says seven).

In their discussion, the authors conclude that “The predicted relation between egg shape and clutch size is supported by a preliminary survey in several avian taxa”. However, the first of their predictions is completely erroneous and the generality of the remainder both unproven and unlikely. As regards single egg clutches, Walters (1994) is incorrectly cited as evidence that albatrosses, fulmars and storm-petrels (which form the Procellariiformes, not Procellariidae) lay spherical eggs. In fact, these birds generally lay cylindrical, elliptical or longitudinal eggs (see Walters 1994, p. 20 for definitions and illustrations of these shapes), but never spherical. Furthermore, I am unaware of any bird species laying a single egg clutch in which the egg is spherical.

Biconical eggs are rare in nature, and are not confined to clutches of two or three. They are found most often in grebes, which lay from 1 to 9 eggs, most commonly four. Waders typically lay 4 eggs and these are usually strongly conical. However, clutches of 4 eggs occur in many species which do not lay conical eggs. Spherical eggs typically occur in birds that nest in holes, such as kingfishers and bee-eaters. Clutch size in these varies from 3 upwards to 10 or so.

Although essentially a popular book, Walters (1994) contains adequate information on egg shape and clutch size to have allowed for objective preliminary quantitative testing of the predictions generated. Furthermore, based on nearly 30 years curating what is probably the world's largest egg collection in the Natural History Museum, Tring, I strongly doubt the general validity of any of their predictions.

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Bulletin of the British Ornithologists' Club



Volume 120 No. 2

June 2000

MEETINGS are held in the **Sherfield Building of Imperial College**, South Kensington, London, SW7. The nearest Tube station is at South Kensington, and car parking facilities are available; a map of the area will be sent to members, on request. The cash bar is open from **6.15 pm**, and a buffet supper, of two courses followed by coffee, is served at **7.00 pm**. (A vegetarian menu can be arranged if ordered at the time of booking). Dinner charges are currently **£16.00** but will be increased to **£17.00**, as from **3 October**. Informal talks are given on completion, commencing at about 8.00 pm.

FORTHCOMING MEETINGS

Tuesday 4 July - Dr Lincoln Fishpool on "*Important Bird Areas in Africa*" Dr Fishpool started his professional life as an entomologist, working extensively in various parts of West and East Africa. During the course of this time a minor interest in African ornithology developed into a more serious obsession. In consequence, he changed career and for the past six years has worked for BirdLife International as coordinator of its Important Bird Areas in Africa programme. A book documenting these sites is due for publication later this year.

Applications to the Hon. Secretary by 20 June please.

3 October, - Julian Hume on "*A window into the past - the diversity of fossil records on islands.*" Julian was born in 1960. An initial career in art and illustration, specialising in reconstructing extinct species, led to a degree in Palaeontology and Evolution in Portsmouth University in 1999. His study of extinct birds began in 1990 and he has visited and worked fossil localities both in Hawaii, in association with the Smithsonian Institution, and the Mascarene Islands with Portsmouth University and the Bird Group, Natural History Museum, Tring. This work continues concurrently with a PhD on the Vertebrate Palaeontology of the Western Indian Ocean, with a special reference to the Mascarene Islands. He is planning a return to the Mascarenes this summer to study the geology and stratigraphy of the fossil sites.

Applications to the Hon. Secretary by 19 September, please.

31 October - Professor R.A. Cheke on "*Aspects of Sunbird Biology*". Robert has been watching sunbirds during regular visits to Africa since 1967. In 1976 he began working on a variety of aid projects, principally on onchocerciasis vectors and migrant pests such as locusts and quelea birds, as part of his work for the Natural Resources Institute (NRI). NRI is now part of the University of Greenwich, where Robert is Professor of Tropical Zoology. He is co-author of the BOU Check-list on the *Birds of Togo* and a forthcoming book on sunbirds, flowerpeckers, spiderhunters and sugarbirds. He served on the BOC Committee from 1991-95, and is a former Chairman of the Publications Committee.

Applications to the Hon. Secretary by 17 October please.

Tel/FAX: 01730-825280 for late bookings and cancellations.

Future Meetings.

28 November 2000 Dr Derek Pomeroy "*The Bird Atlas of Uganda*"

Advance dates for 2001. Bookings have been made with Imperial College for the following eight dinner meetings:

Tuesdays 16 January, 6 March, 3 April, 1 May - AGM and social evening, 3 July, 25 September, 6 November, and 4 December.

Overseas Members visiting Britain are especially welcome at these meetings, and the Hon. Secretary would be especially pleased to hear from anyone who can offer to talk to the Club next year, on these dates, giving as much advance notice as possible - please contact: Michael Casement, Dene Cottage, West Harting, Petersfield, Hants. GU31 5PA. UK. Tel/FAX: 01730-825280 (or **Email: mbcasement@aol.com**).

Bulletin of the BRITISH ORNITHOLOGISTS' CLUB

Vol. 120 No. 2

Published 17 June 2000

CLUB NEWS

The eight hundred and ninetieth meeting of the Club was held on Tuesday 18 January 2000, at 6.15pm. 33 Members and 18 guests attended.

Members present were: Rev. T.W. GLADWIN (*Chairman*), Miss H. BAKER, Sir David BANNERMAN Bt., P.J. BELMAN, K.F. BETTON, I.R. BISHOP, Mrs D.M. BRADLEY, D.R. CALDER, Cdr M.B. CASEMENT RN, Professor R.J. CHANDLER, Professor R.A. CHEKE, S.P. DUDLEY, S.J. FARNSWORTH, Dr. C.T. FISHER, F.M. GAUNTLETT, A. GIBBS, D. GRIFFIN, J. HORNBUCKLE (*Speaker*), J.A. JOBLING, R.H. KETTLE, Dr. C.F. MANN, D.J. MONTIER, Mrs A.M. MOORE, R.G. MORGAN, R.C. PRICE, Dr. R.P. PRŶS-JONES, N.J. REDMAN, R.E. SCOTT, P.J. SELLAR, F.D. STEINHEIMER, N.H.F. STONE, C.W.R. STOREY and M.P. WALTERS.

Guests attending were: M.J. BRADLEY, Lady P. BANNERMAN, Ms G. BONHAM, Mrs C.R. CASEMENT, Mrs J.B. CALDER, J.M. CLARK, J.A. EYRE, Canon C. GARNER and Mrs J. GARNER, Mrs M. GAUNTLETT, Mrs J.M. GLADWIN, Ms R. HAMILTON, M. HUNNYBUN, P.J. MOORE, Mrs M. MONTIER, R. RANFT, Mrs L. SIMMONS and M. WALTON.

On completion, Jon Hornbuckle gave a talk, illustrated with superb colour slides on *Birds of Andean Peru*. This concentrated on the avifauna of the upper Río Mayo, where the humid temperate and subtropical forest, in the easternmost range of the north Peruvian Andes, is particularly rich but under serious threat of deforestation. It was first explored some 20 years ago, when specimens of five species new to science were taken, but has rarely been visited since. A small team carried out a rapid survey there in November 1998 with the result that 420 species are now known to occur in the relatively narrow elevational range of 1,000 - 2,300m.

The major constituents of the avifauna are hummingbirds *Trochilidae* (39 species), tyrant flycatchers *Tyrannidae* (72 species) and tanagers *Thraupinae* (59 species), but representatives of the full spectrum of Peruvian forest birds are found there including 10 cotingas *Cotingidae*. Examples of these were illustrated and aspects of their ecology described.

At least 23 Red Data Book species occur and a further seven or more restricted-range species have been recorded. These include the enigmatic Long-whiskered Owlet *Xenoglaux loweryi* and Ochre-faced Antpitta *Grallaricula ochraceifrons*, which are both known only from five specimens, three of which were taken here in 1976. Despite mist-netting at night, *Xenoglaux* was not recorded during the survey, but a single female *G. ochraceifrons* was caught, the first time the bird had been seen since 1978. Most of the other rare birds were also recorded and 56 species were added to the area's inventory.

Tragically, this immensely important forest is now being destroyed by settlers and opportunists. A large section, 182,000 ha, is officially protected to conserve the watershed and the German government has written off 4 million DM of debt against a Peruvian-proposed conservation project here. However, there is no active protection in force and the German money appears unlikely to be used for forest conservation. Hence there is an urgent need for a conservation initiative.

The talk concluded with a lively question period and discussion.

The eight hundred and ninety-first meeting of the Club was held on Tuesday 29 February 2000, at 6.15pm. 25 Members and 6 guests attended.

Members present were: Rev. T.W. GLADWIN (*Chairman*), Miss H. BAKER, P.J. BELMAN, D.R. CALDER, Cdr M.B. CASEMENT RN, Professor R.J. CHANDLER, D.J. FISHER, F.M. GAUNTLETT,

A. GIBBS, D. GRIFFIN, J.A. JOBLING (*Speaker*), C.A.R. HELM, J.P. HUME, Dr. C.F. MANN, D.J. MONTIER, Mrs A.M. MOORE, R.G. MORGAN, P.J. OLIVER, Dr R.P. PRÛS-JONES, N.J. REDMAN, R.E. SCOTT, Dr. R.C. SELF, Dr. D.W. SNOW, N.H.F. STONE, and C.W.R. STOREY.

Guests attending were: Mrs C.R. CASEMENT, Mrs M. GAUNTLETT, Mrs J.M. GLADWIN, Ms K. HOFF, Mrs M. MONTIER, and P.J. MOORE.

After dinner the meeting was entertained by James Jobling with an illustrated talk about English bird names entitled *Pallas's Gull and the Inornate Warbler*. As a preamble to his forthcoming *Encyclopaedia of English and Scientific Bird Names*, James compiled a sequence of the birds of the world allocating each form a distinctive English substantive name. For most forms this was a simple task of selecting a name from the most recent check lists or popular family treatments. For example, Afrotropical endemics were given the names selected by Dowsett & Forbes-Watson (1993), Palaearctic species those in Beaman (1994), and so on. Problems occurred when the selected authorities clashed or defied tradition and usage.

Although generally approving of efforts to stabilise the English names of birds, the speaker objected to that task being taken over by American "experts", who seemed determined to smother ornithological history by the wholesale dumping of eponyms and of well-established names, but whose attempts at imposing a uniformity that mirrored scientific nomenclature were insidiously being incorporated into popular journals and books. He highlighted the parochial nature of American ornithology and the uninformed lists that had amused us in the past with Inornate Warbler, Oldean's Thrush, Chabert's Vanga, and Vernal's Hanging Parrot! A selection of birds whose names had caused furore and disagreement over the years was illustrated by colour slides, and pertinent comment on the Dunnock, Bearded Tit, Common Gull, Great Black-headed Gull, and White-winged Black Tern, in particular, attracted much approval.

The speaker finally appealed to the BOU/BOC to compile an official world list of English bird names, rather than wait for the testudine efforts of the International Committee already set up for that purpose. This would not inhibit the natural development of English, nor would it outlaw the use of well-loved and entrenched alternatives by the public and the bird-watching community. It should not compete with nor necessarily mirror scientific nomenclature, rightly shackled by rules, but be regarded as a vital tool in day-to-day communication.

There followed a very lively discussion, in which voices were raised and the likes of "garbage" and "rubbish" banded about. An attempted red herring (on scientific nomenclature) was firmly dealt with and there was general contumely against our American friends. Indeed, one diner suggested that if the name of the talk had been billed as "Death to Loon and Jaeger" it would have attracted a record audience! Others opined that Latin should be reintroduced into school curricula and that the bird watching community should be encouraged in the use of scientific names (like their colleagues in Scandinavia, Germany, and The Netherlands, and in botany). A voice in the wilderness cried that we should just ignore the advance of Americana, but the general feeling of the meeting was that efforts should be made to protect our linguistic traditions and culture against the juggernaut of computer-speak.

Registered Charity No. 279583

TRUSTEES ANNUAL REPORT FOR 1999

List of Trustees - Committee

Reverend T.W. GLADWIN *Chairman* (1997); Dr. R.P. PRÛS-JONES *Vice-Chairman* (1999); Cdr. M.B. CASEMENT, O.B.E., R.N. *Hon. Secretary* (1996); D.J. MONTIER *Hon. Treasurer* (1997); D. GRIFFIN (1997); N.J. REDMAN (1997); R.E. SCOTT (1998); J.A. JOBLING (1999); Dr. C.F. MANN (1999)

Objects of the Charity. The promotion of scientific discussion between Members of the British Ornithologists' Union and others interested in ornithology, and to facilitate the dissemination of scientific information connected with ornithology.

Activities and Review of the Year

Meetings. Eight evening meetings were held in 1999, in the Sherfield Building at Imperial College, London. A total of 296 (202 members and 94 guests) attended these meetings, which represented an average attendance of 37. The programme of speakers during the year again covered a wide variety of ornithological subjects in both Britain and overseas. As for the past two years, the May meeting following the AGM was in the form of a social evening, during which informal short talks and brief discussions were contributed by seven participants, on a range of topical subjects.

On 24th June there was a Club outing to the Charles Darwin Museum at Down House, Downe, Kent.

Committee. The Committee met six times during the year, and the attendance was 80%. The chief topics for discussions concerned the progress of Club publications, the business of the Publications Sub-committee (see below), and ideas for employing the greater use of modern technology for the publication of the *Bulletin*, both to achieve cost savings and to enhance its appearance. Following further cost increases by Imperial College, dinner charges were increased to £16, with effect from the February 2000 meeting. The administration and re-organisation of Membership records and subscription payments was progressed by the Hon. Secretary, with the increasing use of E-mail.

Also discussed were various ideas for increasing the circulation of the *Bulletin*, and the possible widening of the Membership, after due consultation, with the possibility of proposing changes to the Rules, in the year 2001.

The Committee continues to be most grateful to the Trustees of the Herbert Stevens Trust Fund (Mr Nigel Crocker, Mr Richard Price and Mr Peter Oliver) for their time and expertise advising on the performance of the Fund.

Publications Sub-committee. The long-awaited *Type Specimens of Bird Skins in the University Museum of Zoology, Cambridge, United Kingdom*, No. 4 in the *Occasional Publications* series, was printed at the end of 1999. Substantial pre-publication orders demonstrate the important niche this work will fill, and the BOC is greatly indebted to Mrs Amberley Moore for the leading role she played in seeing it through to publication.

Two further works are scheduled to be finalised within the coming year, namely the proceedings of the November 1999 BOU/BOC/NHM/BirdLife conference and the *Bird Atlas of Uganda*. The latter work will be both larger and with a longer print run than volumes previously produced by the BOC, and hence is being undertaken as a joint project with the BOU. Although well advanced, publication of it in time for the September 2000 Pan-African Ornithological Congress now unfortunately appears not possible.

Sales of past Club publications continue at a steady rate. A number of proposals for additional volumes in the *Occasional Publications* series are under discussion, but no definite commitment has as yet been entered into for any of them.

Membership. There were 558 paid-up Members at 31 December 1999 - 312 with addresses in the U.K. and 246 overseas. Active recruitment from the newly-elected Members of the Union continued, resulting in 24 new Members and two rejoining the Club during the year.

It is with great regret that the Committee reports the deaths in the past year of four Club Members: Professor Charles G. Sibley (1995-98), R.E.F. Peal, (1963-99), (*Committee 1969-71, 1993-97, Hon. Secretary 1971-89, Chairman 1989-93*), Col J Vincent M.B.E. (1934-99 *Hon. Life Member*), and P.B. Snetsinger (1999). There were also seven resignations, and 16 were removed under Rule (7).

The publication of the Members' Address List annually with the Index was discontinued in 1997, in order to reduce costs. The Hon. Secretary continues to prepare a list annually, and duplicated copies of the 2000 list are available, free of charge, for any Member requesting a copy, though a stamped and addressed envelope (A5), or a contribution towards the cost of postage, will be gratefully received.

The Bulletin. Volume 119 comprised 272 pages and included 34 papers. A new species of laughing-thrush *Garrulax* was described (and illustrated in colour) from Vietnam, and a new subspecies of Cave Swallow *Petrochelidon fulva* was described from Puerto Rico. The Neotropics again dominated faunistic reports, but Africa and Oceania were also represented. Five colour plates were reproduced during the year, and we are grateful to our sponsors for making this possible. In addition, the quality of paper used in the *Bulletin* was improved in 1999, allowing the inclusion of monochrome photographs within the text of papers where appropriate. Papers published in 1999 averaged 15 months between receipt and publication (range 4 to 23 months).

During 1999, 44 papers were received of which 35 have been accepted. All papers are reviewed and the Editor is indebted to those who are prepared to devote time (sometimes in considerable amounts) to helping to maintain the high standard of papers published in the *Bulletin*. Again, Mary Muller compiled the index, Michael Casement the Club Notes and cover text, and Effie Warr has distributed the free offprints and has provided library and other assistance. We are grateful to all for their help.

At the end of 1999, the Publications Sub-committee decided, on grounds of cost, to change our printer. It is therefore opportune for the Editor publicly to thank Frank Hemmings and his team at Henry Ling Ltd, Dorchester, for their service to the Club over the past 11 years, and for the pleasant way in which all editorial matters have been handled.

Bulletin Sales. Sales to Non-member Subscribers totalled 146, with 24 in the UK and 122 overseas (23 countries). Of the latter, 48 were to the United States of America, and 15 to Germany; additionally, 8 free copies UK, (including 5 to meet legal requirements) and 6 overseas.

Finance. Total revenue of £33,461 in 1999 was similar to the previous year. Under individual headings, there was an increase in donations, a receipt of £649 (including the tax recovery under Gift Aid) as sponsorship for colour plates in the *Bulletin* and a refund of £260 for defective copies of the re-printed *Bulletin* 117 (2) - the Taxonomy conference number. These items more than offset reductions elsewhere. Interest received on deposit accounts was down by about £700, reflecting the reduction in interest rates during 1999, and income from sales of publications was about £800 lower, the new types Catalogue by Con Benson not being distributed until early in the year 2000.

Bulletin costs were a little less than the previous year and administration expenses virtually unchanged, but total expenditure of £30,130 includes increases under other headings. In particular, the payment of £1,251 to sponsor the attendance of a number of delegates (mainly from Eastern European countries) at the BOU/BOC/NHM/BirdLife conference in November 1999, and a further £1,000 (against £500 in 1998) towards production of the *Bird Atlas of Uganda*. "Other publications" also includes £6,054 as the cost of the Benson catalogue. A sum of £770 for producing and printing colour plates in that volume was funded out of the Publications Fund and largely covered by very generous donations made to that Fund in memory of Ronald Peal.

The net result for the year was a surplus of income over expenditure of £3,331, further augmented by another satisfactory performance of the Club's investments which, despite greater volatility in the stockmarket in 1999, produced an increase in value of £14,736, the two figures together taking the net assets of the Club at 31st December 1999 to nearly £300,000.

Trustees' responsibilities

Under the Charities Act 1993, the trustees are required to prepare a statement of accounts for each financial year which give a true and fair view of the state of affairs of the charity at the end of the financial year and of the incoming resources and application of resources in the year. In preparing the statement the trustees are required to :

- select suitable accounting policies and then apply them consistently;
- make judgements and estimates that are reasonable and prudent;
- state whether applicable accounting standards and statements of recommended practice have been followed, subject to any material departures disclosed and explained in the statement of accounts.

- prepare the financial accounts on the going concern basis unless it is inappropriate to presume that the charity will continue its operations.

The trustees are responsible for keeping proper accounting records which disclose with reasonable accuracy at any time the financial position of the charity and to enable them to ensure that any statement of account prepared by them complies with the regulations under section 41(1) of the Charities Act 1993. They are also responsible for safeguarding the assets of the trust and hence for taking reasonable steps for the prevention and detection of fraud and other irregularities.

BRITISH ORNITHOLOGISTS' CLUB

Registered Charity No. 279583

BALANCE SHEET AS AT 31 DECEMBER 1999

	Notes	£	1999	£	£	1998	£
TANGIBLE FIXED ASSETS	2	-		20			30
INVESTMENTS							
At market value	3			231,224			216,488
CURRENT ASSETS							
Stock of publications		100				<i>100</i>	
Cash at bank and in hand		3,544				<i>2,825</i>	
Cash on deposit		79,688				<i>71,245</i>	
Prepayments		480				<i>480</i>	
Other debtors		100				-	
				83,912		<i>74,650</i>	
CURRENT LIABILITIES							
Subscriptions in advance		(4,443)				<i>(5,730)</i>	
Creditors falling due within one year		(11,204)				<i>(3,996)</i>	
				68,265			<i>64,924</i>
TOTAL ASSETS				£ 299,509			£ 281,442
FUNDS							
UNRESTRICTED							
Designated	4			-			<i>3,000</i>
Other	5			291,683			<i>270,802</i>
				291,683			<i>273,802</i>
RESTRICTED	6			7,826			<i>7,640</i>
				£ 299,509			£ 281,442

Approved and signed on behalf of the Trustees

T W Gladwin

Chairman

Date: 4th April 2000

STATEMENT OF FINANCIAL ACTIVITIES - YEAR ENDED 31 DECEMBER 1999

	Unrestricted Funds 1999 Notes £	Restricted Funds 1999 £	TOTAL 1999 £	TOTAL 1998 £
INCOME				
SUBSCRIPTIONS				
Members	6,704	-	6,704	6,591
Non-member subscribers	3,530	-	3,530	3,337
Income tax recoverable under Deeds of Covenant	401	-	401	396
	<u>10,635</u>	<u>-</u>	<u>10,635</u>	<u>10,324</u>
DONATIONS	<u>91</u>	<u>537</u>	<u>628</u>	<u>141</u>
SPONSORSHIP of bulletin colour illustrations (including tax recovery of Gift Aid)	<u>649</u>	<u>-</u>	<u>649</u>	<u>-</u>
INVESTMENT INCOME				
Herbert Stevens Trust Fund	10,712	-	10,712	10,422
Barrington Trust Fund COIF Income Shares	40	-	40	39
Interest received	3,543	419	3,962	4,687
	<u>14,295</u>	<u>419</u>	<u>14,714</u>	<u>15,148</u>
SALES OF PUBLICATIONS				
Bulletin	796	-	796	656
Other publications	1,271	-	1,271	2,062
Bulletin 117(2) – Avian Taxonomy conference issue – refund for defective copies	<u>260</u>	<u>-</u>	<u>260</u>	<u>-</u>
	<u>2,327</u>	<u>-</u>	<u>2,327</u>	<u>2,718</u>
MEETINGS	<u>4,455</u>	<u>-</u>	<u>4,455</u>	<u>4,642</u>
OTHER INCOME	<u>53</u>	<u>-</u>	<u>53</u>	<u>145</u>
TOTAL INCOME	<u>32,505</u>	<u>956</u>	<u>33,461</u>	<u>33,118</u>
EXPENDITURE				
DIRECT CHARITABLE EXPENDITURE				
MEETINGS				
Room hire, speakers' expenses, etc	1,324	-	1,324	1,195
SPONSORSHIP for Avian Taxonomy Conference "Why Museums Matter"	<u>1,251</u>	<u>-</u>	<u>1,251</u>	<u>-</u>
BOC BULLETIN				
Production, printing and distribution	14,043	-	14,043	14,646
OTHER PUBLICATIONS				
Production and publication	5,284	770	6,054	634
Future publications	1,000	-	1,000	500
Publicity, postage and packing	131	-	131	140
OTHER EXPENDITURE				
MEETINGS				
Restaurant	4,519	-	4,519	4,521
ADMINISTRATION	<u>1,808</u>	<u>-</u>	<u>1,808</u>	<u>1,823</u>
TOTAL EXPENDITURE	<u>29,360</u>	<u>770</u>	<u>30,130</u>	<u>23,459</u>

	Unrestricted Funds 1999 £	Restricted Funds 1999 £	TOTAL 1999 £	TOTAL 1998 £
EXCESS OF INCOME OVER EXPENDITURE	3,145	186	3,331	9,659
Appreciation in value of investments	14,736	-	14,736	13,610
	<u>17,881</u>	<u>186</u>	<u>18,067</u>	<u>23,269</u>
TOTAL FUNDS brought forward at 1 January 1999	273,802	7,640	281,442	258,173
TOTAL FUNDS at 31 December 1999	£ 291,683	£ 7,826	£ 299,509	£ 281,442

NOTES TO THE ACCOUNTS - YEAR ENDED 31 DECEMBER 1999

1. ACCOUNTING POLICIES

a) Basis of Accounts

The financial statements are prepared under the historical cost convention, as modified by the inclusion of investments in the Herbert Stevens and Barrington Trust Funds at market values.

b) Depreciation

Depreciation is calculated to write off fixed assets over their expected useful lives at an annual rate of 10% on cost.

c) Investments and Cash Deposits

The Herbert Stevens and Barrington Trust funds are invested in quoted UK charity unit trusts and shown in the Balance Sheet at year-end market values. Income from these funds and from cash deposits is included in the Statement of Financial Activities on a receipts basis.

d) Publications

The cost of publications is written off in the Statement of Financial Activities as incurred except for a nominal stock value of £100 carried in the Balance Sheet.

2. TANGIBLE FIXED ASSETS

	Projection Equipment £
Cost at 1 January and 31 December 1999	100
Accumulated depreciation at 1 January 1999	70
Charge for the year	10
At 31 December 1999	80
Net book value at 31 December 1999	£ 20
Net book value at 31 December 1998	£ 30

3. INVESTMENTS - at market value

	1999 £	1998 £
Herbert Stevens Trust Fund	229,917	215,346
Barrington Trust Fund	1,307	1,142
	<u>£ 231,224</u>	<u>£ 216,488</u>

4. UNRESTRICTED DESIGNATED FUND

for future publications

	1999 £
Balance at 1 January 1999	3,000
Applied during the year	(3,000)
Balance at 31 December 1999	-

5. OTHER UNRESTRICTED FUNDS

	GENERAL FUND £	HERBERT STEVENS TRUST FUND £	BARRINGTON TRUST FUND £	TOTAL £
Balances at 1 January 1999	54,314	215,346	1,142	270,802
Appreciation in value of investments during year	-	14,571	165	14,736
Surplus of income over expenditure after allocating £3,000 of cost of new publications to Designated Fund (Note 4)	6,145	-	-	6,145
Balances at 31 December 1999	£ 60,459	£ 229,917	£ 1,307	£ 291,683

6. RESTRICTED FUNDS

	PUBLICATIONS FUND £	BIRD ATLAS OF UGANDA FUND £	TOTAL £
Balances at 1 January 1999	4,674	2,966	7,640
Donations	537	-	537
Interest - gross	262	157	419
New publications	(770)	-	(770)
Balances at 31 December 1999	£ 4,703	£ 3,123	£ 7,826

7. ADMINISTRATION EXPENSES include:

	1999 £	1998 £
Audit and Independent examination fees	550	550
Depreciation of tangible fixed assets	10	10

8. REIMBURSEMENT OF EXPENSES

Committee members are reimbursed for expenses incurred by them on behalf of the Club. The amount reimbursed during the year was **£ 1,870 (1998 £808)**.

INDEPENDENT EXAMINERS REPORT TO THE TRUSTEES OF THE BRITISH ORNITHOLOGISTS' CLUB

This is a report in respect of an examination carried out on the accounts set out on pages 69 to 72 under Section 43 of the Charities Act 1993 and in accordance with directions given by the Charity Commissioners under Sub-section 7(b) of that Section.

Respective responsibilities of trustees and independent examiners

As described on page 68 the Trustees are responsible for the preparation of the accounts and they consider that Charities Act 1993 Section 43(2) (audit requirement) does not apply. It is our responsibility to carry out procedures designed to enable us to report our opinion.

Basis of Opinion

This report is in respect of an examination carried out under section 43 of the Charities Act 1993 and in accordance with the directions given by the Charity Commissioners under section 43(7)(b). An examination includes a review of the accounting records kept by the charity trustees and a comparison of the accounts presented with those records. It also includes a review of the accounts and making such enquiries as are necessary for the purposes of this report. The procedures undertaken do not constitute an audit.

Opinion

No matter has come to our attention in connection with our examination which gives us reasonable cause not to believe that in any material respect:

- (i) accounting records have been kept in accordance with Section 41 of the Charities Act 1993; or
- (ii) the accounts accord with those records; or
- (iii) the statement of accounts complies with the accounting requirements of the Charities Act 1993.

No matter has come to our attention in connection with our examination to which, in our opinion, attention should be drawn to enable a proper understanding of these accounts.

PORRITT RAINEY & CO.**Registered Auditors****Chartered Accountants****Sevenoaks****Kent TN13 1XR**

BOOKS RECEIVED

Piechocki, R. (2000) Ornithologen-Briefe an Max Schönwetter (1874-1961) Zur Erinnerung an den 125. Geburtstag des Begründers der wissenschaftlichen Oologie. *Anz. Ver. Thüring. Ornithol.* **3** (special issue): 1-108. Pp. 108, 43 monochrome plates, 1 colour plate. ISSN 0940-4708. 17 x 24 cm. Verein Thüringer Ornithologen e. V., Naturkundemuseum Erfurt, Postfach 769, D-99015 Erfurt, Germany.

Oology, the scientific study of eggs, has fallen into disrepute over the last few decades as it has been equated with egg collecting. However, oology starts where egg collecting ends, as Schönwetter pointed out in one of his letters. Max Schönwetter wrote the "Handbuch der Oologie" (1960-1992), the standard work for oologists, giving measurements and descriptions for almost all known eggs. By publishing and annotating a selection of letters Schönwetter received from and wrote to ornithologists around the world, Piechocki gives many insights into Schönwetter's life and work.

Schönwetter was born in Vienna in 1874 but spend most of his life in Gotha, Thüringen. His interest in eggs was sparked through finding a fragment of a partridge egg on the shore as a small boy. Over the years he built up a large collection of 19,000 eggs from 3,800 species, now in the Zoological Institute, Halle/Saale, together with his oological library, letters, manuscripts and egg measurements. Only relatively late in his life did Schönwetter begin serious oological studies. His first publication was in 1905 on egg measurements of the Prince of Wales pheasant. While working as a land surveyor, he used all his spare time to further his oological studies, resulting in 35 publications and a neglected wife. Further, he helped with the identification of eggs from many scientific expeditions (e.g. Kansu, 1929-31; China 1937-38).

Schönwetter visited the large European egg collections, including Berlin, Vienna, the Rothschild Museum in Tring and many private collections. There he measured more eggs than anyone else for his handbook of oology, which he had planned since 1924 and wanted to write during his retirement. However, as he retired on 1 September 1939—the day WWII began—progress was hindered by damage to his collection from bombs as well as lack of paper and carbon paper. Also, Peter's checklist was then far from complete, posing many problems with taxonomy. He was much encouraged and supported—

financially and intellectually—by ornithologists such as Henrici, Stresemann, Boxberger, and many others. However, when the work was nearing completion after over 20 years, W. Makatsch, who had promised to help editing the text withheld the manuscript for several years. More than half of the volume under review is dedicated to letters relating to the drama of writing and publishing the “Handbuch der Oologie”, Schönwetter’s masterpiece. Schönwetter had already given up hope of ever seeing his work published when W. Meise not only helped with taxonomy but also edited the book. One year before Schönwetter’s death, aged 86, the first of 47 parts of his handbook was published.

Piechocki’s selection of letters, illustrated with several figures of important letters, tells the history behind the standard work in oology. Brief biographies with photos of the correspondents and a publication list are also very valuable. Overall a valuable companion volume to the “Handbuch” and of interest to ornithological historians!

Jörn P. W. Scharlemann

Benson, C.W. 1999. *Type specimens of bird skins in the University Museum of Zoology, Cambridge, United Kingdom*. Pp. xiv + 221, 3 colour plates, 17 text figures. £28.00. British Ornithologists’ Club Occasional Publications No. 4. ISBN 0 9522886 3X. (Obtainable from BOC Publications Officer, address on inside back page – add £2.00 p&p UK and Europe, £3.00 p&p elsewhere, airmail rates on request).

C.W. (Con) Benson died in 1982, leaving behind him this impressive work, the most important result of many years work at the Cambridge University Museum of Zoology, which he undertook on his retirement from the Colonial Service. Owing to many adverse circumstances, which are fully described in K.A. Joysey’s long editorial preface (which is also a personal appreciation of Con Benson and includes the obituary from *The Times*), 17 years passed before the work finally achieved publication, and much of the credit for its successful outcome must go to the late Ronald Peal and other members of the Club.

With nearly 30,000 specimens, the Cambridge bird skin collection is not huge by national standards but it contains a comparatively large amount of historical type material; 371 types are dealt with in the catalogue which comprises the bulk of the book. For many of the specimens the catalogue is far more than a mere annotated list; many entries are half a page or more. There are full discussions of all doubtful points, notes on plumages, measurements etc., all presented with Benson’s well-known thoroughness and meticulous attention to detail. Preceding the catalogue is a 23-page “list of authors describing the taxa included in the catalogue”, illustrated by 17 photographs of original labels with the distinctive handwriting of the authors and others associated with the specimens. Following the catalogue are two appendices: “Possible syntype material from Nepal, ex B.H. Hodgson” and “Material from Grand Comoro, ex L. Humblot”, a 4-page bibliography, and a 15-page list of Benson’s publications, spanning 64 years from 1936 to 1999.

The “list of authors” is also much more than a mere list. For several of them there are long entries, with biographical and other details, in particular Dr T. Horsfield, Sir W. Jardine, H.E. Strickland and W. Swainson. This section of the book, supplementing the data given in the catalogue and largely based on original research, should be of considerable value to anyone with an interest not only in type specimens but also in the history of ornithology in the 19th century.

The three coloured plates include a reproduction of Swainson’s beautiful drawing of his type of *Conopophaga ruficeps*, and two paintings by Julian Hume, one of skins of the extinct Rodriguez parrot *Palaeornis exsul* and the other a fine painting of three of the parrots perched in two of the endemic trees of Rodriguez, one now extinct and the other critically endangered.

David Snow

Geographic variation in the Malagasy Scops-Owl (*Otus rutilus* auct.): the existence of an unrecognized species on Madagascar and the taxonomy of other Indian Ocean taxa

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The taxon *Scops madagascariensis* was one of several apparently new mammals and 14 bird species for which A. Grandidier sent scientific descriptions by letter from Madagascar that were published in March 1867 (Grandidier 1867a). However, by June of that year Grandidier had learnt of senior synonyms for seven of his new birds (Grandidier 1867b). Two scops-owls had previously been reported from Madagascar (Kaup 1852, Hartlaub 1861): a brown one, now Sulawesi Scops-Owl *Otus manadensis* (Quoy & Gaimard 1830) and a rufous one, now Malagasy Scops-Owl *Otus rutilus* (Pucheran 1849a); Grandidier synonymised his *Scops madagascariensis* with the former. He then (Grandidier 1867c) followed Schlegel (1866) in listing *rutilus* as a synonym of *manadensis* as well. Since then, only one scops-owl taxon has been formally recognized in Madagascar, and it now is accepted that *rutilus* and *manadensis* (the latter of the Sulawesi region) are separate species.

More recently, it has also become evident that marked differences exist between the songs of scops-owls in eastern and western Madagascar, roughly corresponding to the wet and dry zones, respectively (G. S. Keith, in Marshall 1978; Goodman *et al.* 1997). Recent publications have mentioned the possibility of a second scops-owl in Madagascar based largely on this geographical trend in song (Morris & Hawkins 1998, König *et al.* 1999, Marks *et al.* 1999), but only weak morphological correlates to song type, in the form of a tendency to be more rufescent in the east and greyer in the west, had been recognized (Benson *et al.* 1976, Marshall 1978, Sinclair & Langrand 1998). We examined geographic variation in morphology and vocalizations of the Malagasy Scops-Owl in order to determine whether more than one taxon was involved on Madagascar and how many biological species should be recognized on islands in the western Indian Ocean.

Methods

Specimens of the following taxa (all of which have sometimes been considered conspecific) were studied: Malagasy Scops-Owl, *Otus r. rutilus*, *sensu lato* (hereafter *s.l.*; $n = 141$), the Mayotte Scops-Owl *O. [r.] mayottensis* ($n = 10$), the Moheli Scops-Owl *O. moheliensis* ($n = 3$), the Anjouan Scops-Owl *O. [r.] capnodes* ($n = 47$), the Grand Comoro Scops-Owl *O. pauliani* ($n = 1$), the Pemba Scops-Owl *O. pembaensis* ($n = 6$), and the Seychelles Scops-Owl *O. insularis* ($n = 7$). In the following, *O.*



Plate 1. The Torotoroka Scops-Owl *Otus madagascariensis* (upper four, from left to right: grey morph, reddish-brown morph, dark brown morph, and grey morph; all adults), with the Rainforest Scops-Owl *Otus rutilus* (lower four, from left to right: two rufous morph adults, dark brown morph adult, and a grey morph immature). Original painting by Ian Lewington.

rutilus (if unqualified) refers to the species *sensu strictu* (the primarily eastern form), *O. rutilus* (*s.l.*) is used where the two Madagascar forms were not distinguished. For *moheliensis*, *capnodes*, *pauliani*, and *pembaensis*, all published specimens were examined. Measurements (for consistency, all taken by PCR) were: culmen length from skull base; depth of upper mandible at distal edge of cere; length of straightened 'eartuft'; length of flattened wing (maximum length, Svensson 1970); shortfalls of each primary from the wingtip (the primaries numbered ascendantly, with P1 the outermost, as in Svensson 1970); length of P1 from the smaller overlying under primary coverts; tail length from insertion point between the central rectrices; tail graduation as the distance between the tips of the longest (central, R1) and the shortest (outermost, R6) rectrices; tarsus length (by the standard method in Svensson 1970); minimum width of the tarsus; greatest distal tarsus width; lengths of middle claw and hindclaw from the distal scute, and middle claw depth at the same point; lengths of longest (straightened) rectal bristle and distal extension of the auriculars measured from the bases; length of unfeathered front tarsus measured from the tip of the most distal feathers to the middle of the joint between the first and second digits of the middle toe (used because this joint is normally prominent on specimens); rear tarsal feathering measured from the point at which feathering is complete around the back to the base of the hallux (although this landmark is more proximal than is the anterior landmark); approximate widths of pale and dark tail bands (measured where band widths are about average) on the midsections of the central rectrices. Percent of tarsus feathered = (tarsus length - front unfeathered length) + (tarsus length - rear unfeathered length) / 2 / tarsus length. Statistics were computed using SYSTAT. Univariate statistics, Principal Components Analyses (PCAs), and Discriminant Functions Analyses (DFAs) were done using untransformed data. For PCAs, correlation matrices were used, and mean group factor scores were tested using two-sample *t*-tests. For adults, five plumage characters (overall colour, prominence of facial disk rim, degree of streaking on back, coarseness of underparts barring, and prominence of banding on upper surface of rectrices) were scored from 1 (*rutilus*-like) to 4 (*madagascariensis*-like), and were tested for significance using Kruskal-Wallis one-way analyses of variance.

For comparative purposes, many photographs were taken of nearly all specimens examined for this study and their labels. Localities and relevant details for specimens used in the analyses are given in Appendix 1. A few specimen localities were illegible or untraceable, and many specimens are simply labelled 'Madagascar'; all these were excluded from analyses. Specimens known to have been collected in a general part of Madagascar, either by regional label annotations or by association with a collector who operated only in that region, were included in statistical analyses when possible but were not mapped. Specimen identifications were done by PCR. Full names of museums for which acronyms are given in the text are presented in the Acknowledgements.

Tape recordings of *Otus rutilus* (*s.l.*) from all major regions of Madagascar were made by TSS and AFAH (Appendix 2). A few additional recordings from other field

observers complemented our geographic sampling. None of the recordings were of birds that were subsequently collected, so the sex of all the tape-recorded birds is unknown. TSS used Canary 1.2.4 (Bioacoustics Research Program, Cornell Laboratory of Ornithology) to analyze his recordings and recordings submitted to him. Default settings for Canary were used except for the display style of sonagrams (smooth rather than boxy) and the overlap was set at 96.88%. One song per song bout was selected for quantitative analysis; the selection was based on loudness of the song, regardless of whether the song was recorded under 'natural' conditions or following tape playback. The variables measured were: number of phrases per song; number of notes per phrase; length of the interval between phrases; length of each phrase in the song; and lowest ($F_{\min}$) and highest ($F_{\max}$) frequency of each harmonic of each phrase. AFAH and RV used Avisoft (Ranft 1995; Specht 1999, Avisoft-SAS, Lab Pro 3.73, Berlin, Germany), and their statistics differ only in that they did not discriminate between harmonics when recording $F_{\min}$ and $F_{\max}$.

Results

A suite of plumage and mensural characters, in combination, distinguish almost all scops-owls from eastern and northern rainforest Malagasy localities from those of western and drier forest areas. This non-clinal variation correlates strongly with song type, and it is therefore necessary to recognize a second species of scops-owl in Madagascar. To facilitate reference for the rest of this paper, we deal first with the nomenclature, and then provide corroborative data for morphology and vocalizations.

As detailed below, *Otus rutilus* (Pucheran 1849) clearly applies to the eastern form, while *Otus madagascariensis* (Grandidier 1867) definitely pertains to the western form. Although *Otus madagascariensis* Smith, 1834 was the original name for the Madagascar Long-eared Owl *Asio madagascariensis*, this and *Scops madagascariensis* have never been placed within the genus *Otus* contemporaneously, so the name *Otus madagascariensis* (Grandidier 1867) is available for, and must henceforth be applied to, the species of scops-owl primarily inhabiting western Madagascar.

Differential diagnoses of *Otus madagascariensis* and *Otus rutilus*

As the original descriptions of both *rutilus* and *madagascariensis* are very brief and do not distinguish between these taxa, we provide amended differential diagnoses below. All characters given below are somewhat variable, but each holds for most specimens, and in combination nearly all specimens can be confidently identified. The characters are those of full adults unless specifically noted.

Otus madagascariensis, like *O. rutilus*, is a medium-sized scops-owl with variable plumage, but the former occurs predominantly in finely vermiculated greyish to yellowish-brown morphs (61.3%, $n = 44$), while *rutilus* occurs mainly in saturated rufous and dark rufescent brown morphs (88.3%, $n = 77$) (Plate 1, Fig. 1). Rarely, *madagascariensis* occurs in a rufous morph (4.5% of the sample), but this is rather

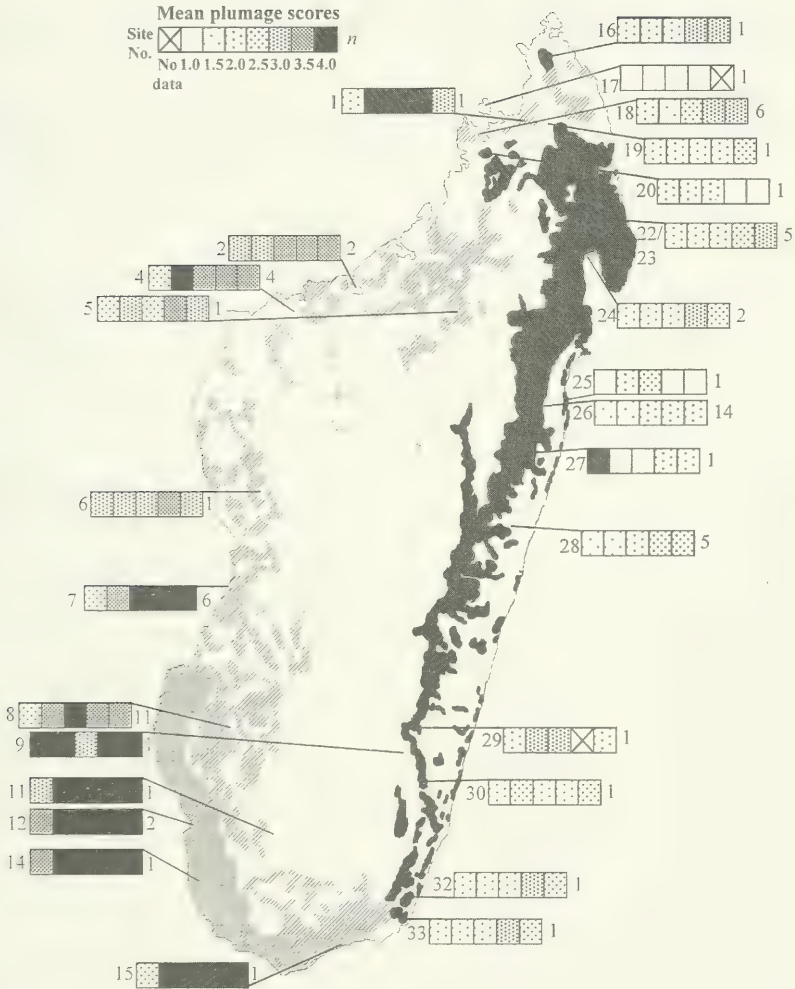


Fig. 1. Scores for qualitative morphological characters of adults of *Otus rutilus* and *O. madagascariensis* mapped against vegetation zones (after Rand 1936; black = rainforest, diagonal hatching = deciduous and dry forest, grey tone = subdesert, white = mainly treeless habitats). Characters were scored from 1 (*rutilus*-like) to 4 (*madagascariensis*-like), and increasing scores are represented by increasing darkness of squares. From left to right for each locality, characters represented by squares are: overall colour (rufous to grey); facial disk rim (obsolete to prominent); mantle streaking (obsolete to prominent); coarseness of cross-barring of underparts (coarse to fine); and tail banding (vague to prominent). Site numbers are on the left of each bar and n for that site on the right. Summary statistics for each locality are provided in Table 4, and localities and associated data are listed in Appendix 1.

pale and orange overall, and retains streaking on the upperparts and white barring on the underparts, while rufous morph *rutilus* are usually rich, dark rufous overall, with obsolete markings.

Otus madagascariensis has less conspicuous whitish supercilia than does *O. rutilus*; its ear tufts are slightly shorter and typically appear prominent because the surrounding feathers are relatively short and compact; its facial disk is nearly uniform in colour but slightly paler near the posterior edge and with a more prominent black rim; its rectal bristles and distal extensions of the auriculars are less profuse, and the longest of these average shorter (Table 1).

The mantle of *Otus madagascariensis* has a relatively solid, paler background colour overlain with long, fairly prominent streaks (Fig. 1, Table 3), while that of *O. rutilus* is typically darker, often with many paler spots, and usually unstreaked or with inconspicuous streaks. The underparts of *madagascariensis* have long thin vertical blackish streaks overlying a finely vermiculated transverse pattern in which white bars are scarcely apparent, and the ground colour contrasts little with scattered white patches of the lower underparts, while the underparts of *rutilus* typically have coarser, shorter blackish streaks overlying a dark background colour with broader, more obvious white cross-bars, and with strongly contrasting scattered white patches on the lower underparts.

In both taxa, the lower scapulars are white with small triangular black tips and usually some fine black subterminal patterning, and the remiges have broad dark and narrower whitish banding. In *madagascariensis*, the tail is relatively long (Table 1) and more graduated, with prominent broad dark bands and narrower pale bands that typically lack rufescence, while *rutilus* has a shorter, squarer tail that is usually weakly banded, often strongly rufescent, and with the dark bands narrower. The wing/tail ratio is lower in *madagascariensis* than for *rutilus* due to the longer tail but similar wing length of the former (Table 1). The tertials of any given specimen are typically banded very like the uppertail surface, and thus those of *madagascariensis* are usually more heavily banded than those of *rutilus*.

Otus madagascariensis has the tarsi heavily feathered, almost to the tarsal joint on the anterior (front) surface and along most of the plantar (rear) edge (Table 1, Fig. 2), and the tarsal feathering is fairly full and dense. In *O. rutilus*, the tarsus is less extensively feathered anteriorly, and much or all of the rear edge of the tarsus is usually unfeathered; the tarsal feathering appears shorter and rather scanty. Both species have moderate-sized, mostly dark bills, narrow pinkish orbital skin, yellow irides, and pale greyish toes, but the claws of *madagascariensis* appear mostly dark in dried specimens and average larger, whereas the smaller ones of *rutilus* appear mostly pale.

Immature *madagascariensis* closely resemble adults in plumage, with perhaps an even more strongly banded uppertail surface, but they are best distinguished on the basis of the narrower, more pointed tips to their rectrices. Immature *rutilus* differ additionally and more obviously from adults (and resemble all ages of *madagascariensis*) in having more prominently banded central rectrices, usually more

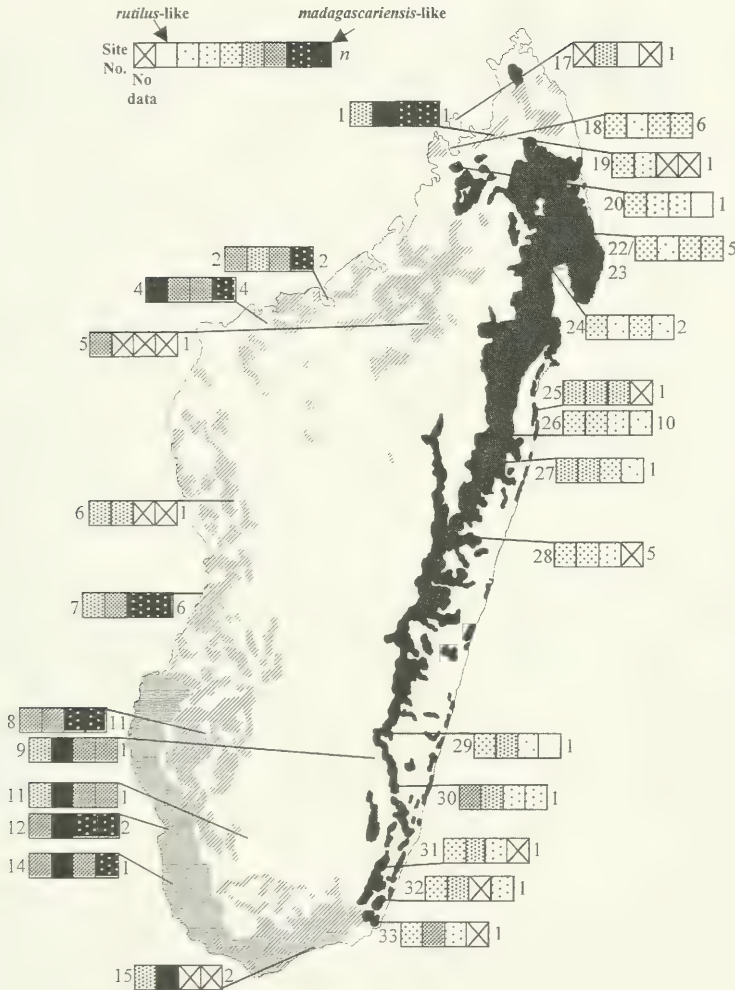


Fig. 2. Scores for quantitative morphological characters of adults of *Otus rutilus* and *O. madagascariensis* mapped against vegetation zones (as in Fig. 1). In order, from left to right, characters are: wing/tail ratio (white > 2.2, black < 1.7); percent of tarsus feathered (white < 45%; black > 85%); Factor 1 scores from PCA (white < 1.5; black > 1.5); and scores from DFA (white < 3.0; black < -3.0). Summary statistics for all data are presented in Tables 1 and 2.

TABLE 1. Summary statistics (mean $\pm$ s.d., *n*) for measurements of *Orus madagascariensis*, *O. rutilus*, Comoran taxa, and *O. pombaensis*. Full adults only were used for *madagascariensis* and *rutilus*, while birds in first basic plumage are included for the other taxa. L = length, d = depth, w = width, s = shortfall from wingtip. Significance levels (ns = $P > 0.05$; * = $P < 0.05$; ** = $P < 0.01$; *** = $P < 0.001$) between *madagascariensis* and *rutilus* (listed after *madagascariensis*) are from two-sample t-tests with separate variances.

Variable	<i>madagascariensis</i>	<i>rutilus</i>	<i>mayottensis</i>	<i>capnoides</i>	<i>moheliensis</i>	<i>pauliani</i>	<i>pombaensis</i>
Culmen l	20.5 $\pm$ 0.8, 31 ns	21.0 $\pm$ 0.8, 58	25.7 $\pm$ 0.4, 8	22.5 $\pm$ 1.1, 23	24.0 $\pm$ 1.6, 3	19.9	21.4 $\pm$ 0.9, 6
Maxilla d	7.0 $\pm$ 0.5, 32 ns	7.2 $\pm$ 0.4, 57	8.2 $\pm$ 0.4, 9	8.0 $\pm$ 0.4, 25	7.9 $\pm$ 0.5, 3	6.3	7.6 $\pm$ 0.3, 6
Tuft l	26.0 $\pm$ 2.5, 31 ***	28.1 $\pm$ 2.3, 57	27.8 $\pm$ 1.4, 10	29.2 $\pm$ 2.6, 17	26.2 $\pm$ 1.7, 3	25.0	24.7 $\pm$ 0.1, 6
Wing l	156.4 $\pm$ 4.4, 31 ns	156.1 $\pm$ 5.2, 57	170.4 $\pm$ 2.9, 10	163.9 $\pm$ 2.8, 25	164.3 $\pm$ 4.5, 3	140/144 ^s	151.5 $\pm$ 2.7, 6
P1 s	41.7 $\pm$ 2.5, 14 ns	42.0 $\pm$ 3.7, 43	43.0 $\pm$ 2.2, 9	41.2 $\pm$ 3.4, 25	40.0 $\pm$ 3.0, 3	37	33.5 $\pm$ 2.3, 6
P2 s	17.2 $\pm$ 1.6, 15 ns	17.7 $\pm$ 2.4, 41	17.9 $\pm$ 1.4, 9	15.9 $\pm$ 2.4, 24	15.3 $\pm$ 2.5, 3	16	11.0 $\pm$ 1.8, 6
P3 s	5.2 $\pm$ 1.1, 15 ns	5.4 $\pm$ 1.3, 41	5.4 $\pm$ 1.8, 10	3.8 $\pm$ 1.3, 24	5.7 $\pm$ 1.1, 3	1	2.1 $\pm$ 0.5, 5
P4 s	0.2 $\pm$ 0.4, 15 ns	0.2 $\pm$ 0.5, 42	0.1 $\pm$ 0.3, 10	0.3 $\pm$ 0.6, 24	0.0 $\pm$ 0.2	0	0.0 $\pm$ 0.6
P5 s	1.0 $\pm$ 0.7, 15 *	0.5 $\pm$ 0.7, 40	1.1 $\pm$ 0.9, 10	0.8 $\pm$ 0.9, 24	0.0 $\pm$ 0.3	0	1.6 $\pm$ 0.9, 6
P6 s	6.2 $\pm$ 1.4, 15 *	5.1 $\pm$ 1.3, 41	6.5 $\pm$ 1.4, 10	4.7 $\pm$ 1.9, 24	6.2 $\pm$ 1.6, 3	11	7.0 $\pm$ 0.6, 6
P7 s	12.1 $\pm$ 1.8, 15 ns	11.8 $\pm$ 2.0, 41	13.5 $\pm$ 1.6, 10	11.8 $\pm$ 2.5, 24	16.3 $\pm$ 2.3, 3	15	12.8 $\pm$ 1.2, 6
P8 s	20.1 $\pm$ 2.0, 15 ns	19.2 $\pm$ 2.5, 40	21.3 $\pm$ 1.5, 10	19.9 $\pm$ 3.7, 24	22.7 $\pm$ 1.1, 3	-	19.3 $\pm$ 1.6, 6
P9 s	26.8 $\pm$ 1.9, 15 ns	26.0 $\pm$ 2.6, 40	27.7 $\pm$ 1.7, 10	27.2 $\pm$ 3.7, 24	30.0 $\pm$ 1.0, 3	-	26.5 $\pm$ 2.3, 6
P10 s	32.9 $\pm$ 2.4, 15 ns	33.0 $\pm$ 3.2, 40	36.3 $\pm$ 2.7, 10	35.3 $\pm$ 3.5, 24	36.7 $\pm$ 1.1, 3	-	32.3 $\pm$ 2.7, 6
Primary 1 l	71.3 $\pm$ 4.6, 28 *	68.9 $\pm$ 4.5, 51	78.5 $\pm$ 3.3, 9	78.5 $\pm$ 3.9, 21	74.7 $\pm$ 3.2, 3	64	69.8 $\pm$ 4.2, 6
Tail l	84.8 $\pm$ 3.0, 30 ***	78.7 $\pm$ 3.8, 54	83.5 $\pm$ 3.1, 9	82.7 $\pm$ 2.5, 19	83.0 $\pm$ 1.0, 3	71/73 ^s	75.0 $\pm$ 1.6, 6
Tail graduation	10.3 $\pm$ 1.7, 25 ***	8.1 $\pm$ 2.1, 48	6.5 $\pm$ 1.2, 9	6.6 $\pm$ 2.6, 14	7.8 $\pm$ 1.6, 3	0	8.8 $\pm$ 2.4, 6
Tarsus l	30.4 $\pm$ 1.2, 30 ns	30.0 $\pm$ 1.4, 58	36.3 $\pm$ 1.1, 10	34.8 $\pm$ 1.1, 25	36.3 $\pm$ 0.6, 3	25.9/30.5 ^s	28.3 $\pm$ 1.3, 6
Tarsus min. w	3.3 $\pm$ 0.3, 31 ***	3.1 $\pm$ 0.2, 50	3.6 $\pm$ 0.3, 10	3.4 $\pm$ 0.2, 22	3.3 $\pm$ 0.4, 3	2.7	3.4 $\pm$ 0.1, 6
Tarsus distal w	7.0 $\pm$ 0.4, 32 ns	6.8 $\pm$ 0.5, 51	7.7 $\pm$ 0.5, 10	7.1 $\pm$ 0.4, 22	7.0 $\pm$ 0.4, 3	6.5	7.4 $\pm$ 0.2, 6
Middle claw l	10.7 $\pm$ 0.6, 32 ***	9.9 $\pm$ 0.7, 53	11.8 $\pm$ 0.6, 9	10.7 $\pm$ 0.6, 22	11.2 $\pm$ 0.4, 3	9.7	10.6 $\pm$ 0.5, 6
Middle claw d	2.3 $\pm$ 0.2, 32 ***	2.1 $\pm$ 0.2, 54	2.4 $\pm$ 0.2, 9	2.4 $\pm$ 0.2, 22	2.1 $\pm$ 0.1, 3	2.0	2.1 $\pm$ 0.1, 6
Hindclaw l	8.8 $\pm$ 0.6, 25 ***	8.2 $\pm$ 0.6, 45	9.5 $\pm$ 0.7, 9	8.8 $\pm$ 0.4, 16	8.3 $\pm$ 0.6, 3	8.2	8.9 $\pm$ 0.4, 6
Rictal bristle l	25.3 $\pm$ 2.3, 33 ***	28.2 $\pm$ 2.7, 55	23.0 $\pm$ 1.7, 10	25.3 $\pm$ 1.9, 23	25.3 $\pm$ 0.7, 3	25.6	21.8 $\pm$ 0.9, 6
Auricular l	18.0 $\pm$ 2.4, 43 ***	22.5 $\pm$ 2.7, 80	14.4 $\pm$ 1.9, 10	18.0 $\pm$ 1.8, 22	15.4 $\pm$ 0.8, 3	20.5	14.4 $\pm$ 0.6, 6
Tarsal feathering, front ¹	4.6 $\pm$ 1.7, 32 ***	6.9 $\pm$ 1.5, 58	9.2 $\pm$ 1.8, 10	15.6 $\pm$ 2.4, 24	13.0 $\pm$ 4.6, 3	13.6	4.1 $\pm$ 0.8, 6
Tarsal feathering, rear ²	7.1 $\pm$ 4.9, 32 ***	17.49 $\pm$ 7.9, 57	7.3 $\pm$ 1.8, 10	9.5 $\pm$ 1.3, 23	9.5 $\pm$ 2.6, 3	8.3	0.0 $\pm$ 0.6
Percent of tarsus feathered ³	80.8 $\pm$ 9.9, 31 ***	59.5 $\pm$ 14.1, 57	77.3 $\pm$ 4.4, 10	64.0 $\pm$ 4.3, 22	68.9 $\pm$ 4.6, 3	57.7	92.7 $\pm$ 1.3, 6
Pale tail band w ⁴	3.0 $\pm$ 0.6, 31 ns	3.1 $\pm$ 0.7, 55	2.7 $\pm$ 0.5, 10	2.2 $\pm$ 0.4, 11	1.9 $\pm$ 0.4, 3	1.4	2.1 $\pm$ 0.3, 6
Dark tail band w ⁴	7.7 $\pm$ 1.3, 31 **	6.7 $\pm$ 1.2, 55	6.5 $\pm$ 1.4, 10	6.4 $\pm$ 1.4, 12	6.7 $\pm$ 0.7, 3	3.3	4.9 $\pm$ 0.9, 6
Wing-tail ratio	1.8 $\pm$ 0.1, 30 ***	2.0 $\pm$ 0.1, 53	2.0 $\pm$ 0.1, 9	2.0 $\pm$ 0.5, 19	2.0 $\pm$ 0.1, 3	2.0	2.0 $\pm$ 0.1, 6

¹From distal edge of feathering to centre of first joint on middle toe ²From proximal edge of hallux ³Feathered length averaged over both sides; see Methods
⁴Approximate measure at middle of central rectrix ⁵Second set of measurements from Herremans et al 1999

prominent streaking on the mantle, and finer barring and vermiculation of the underparts.

At any single locality from which several specimens originate, the intralocality variation is roughly equivalent to the variation in that species, judging by Factor 1 scores. For *madagascariensis* at Tabiky, Factor 1 scores range from *c.* 0 to 2.5 (*n* = 13), and at Namoroka, from *c.* 0.5 to 2.2 (*n* = 3), while for *rutilus*, scores from both Andapa (*n* = 8) and Sianaka (*n* = 28) range from -1.0 to 0. As none of these sites seem to be likely zones of overlap, these levels of variability appear independent of possible intergradation, and they indicate that the observed variation is not clinal in nature. In a PCA between *rutilus* and *madagascariensis* using eight morphological variables, loadings for auricular extension length, rictal bristle length, and extent of unfeathered anterior tarsus were strongly positive on Factor 1, while the loading for tail length in particular was strongly negative on Factor 1 (Table 2). There was virtually no overlap between the mostly negative Factor 1 scores of *rutilus* and the mostly positive scores of *madagascariensis*; mean factor 1 scores were highly significantly different between the species (Table 2). Factor 1 is a shape axis showing that birds with long auricular and rictal bristles and more extensively naked front tarsi also had short tails (*rutilus*), while birds with short bristles and more feathered tarsi had long tails (*madagascariensis*). Factor 2, although with a significant eigenvalue, did not differ between the two groups in any discernible pattern, nor in mean group factor scores. In a DFA using the same variables, specimens of *madagascariensis* were 100% correctly classified, while 89% of *rutilus* specimens were correctly classified (Table 2). The approximate *F* values were highly significantly different ($P < 0.0001$) between *madagascariensis* (Approximate $F = -2.35 \pm 0.62$, *n* = 20) and *rutilus* (Approximate $F = 1.07 \pm 1.13$, *n* = 44; Table 2). Of the plumage characters that were scored for adults, all were highly significantly different between *madagascariensis* and *rutilus* (Table 3).

Vocalizations

The number of phrases in the songs of both taxa varies from 3 to 11; this variation has no geographic component. In most other characters measured, however, there are significant differences between the songs of *madagascariensis* and *rutilus* (Table 4). The song of *rutilus* is typically very simple: a series of phrases of *c.* 0.16 s, each phrase separated by an interval of *c.* 0.21 s, and from *c.* 0.65 to 1.04 kHz in frequency (Fig. 3). Each phrase almost always consists of a single, clear note with a flat shape (i. e., all on one frequency). It is apparent from the waveform display (as shown by Canary), however, that in the songs of some individuals of *rutilus* the phrases may be slightly 'pulsed' (to a level audible to the human ear), although in almost all such cases the phrase is clearly represented as a single note on the accompanying sonagram (e.g., Fig. 3, song from Périnet). Very rarely, however, a single phrase in a *rutilus* song may contain two separate notes (e.g., the first phrase of songs of LNS 95695, recorded at Ranomafana). Harmonics in the song are rare, and when present are

TABLE 2.

Component loadings and summary statistics for principal components analysis (PCAs of Factors 1-3 and discriminant functions analysis (DFA) for *Otus rutilus* and *O. madagascariensis* (combined in the PCA and DFA but grouped separately for two-sample *t*-tests with separate variances).

Abbreviations as for Table 1.

Variable	PCA Component	DFA Classification		<i>rutulus</i>	
	loadings	functions	<i>madagascariensis</i>	F-to-	remove
	1	2			
Eartuft 1	0.48	0.56	-1.16	-1.09	0.09
Auricular extension 1	0.83	0.15	2.94	3.42	4.10
Rictal bristle 1	0.70	0.35	1.69	2.03	2.23
Wing 1	-0.20	0.74	5.28	5.40	1.04
Primary 1 1	-0.43	0.64	0.57	0.48	0.46
Tail 1	-0.75	0.39	4.91	4.26	13.34
Tarsus 1	-0.28	-0.07	16.79	16.83	0.01
L of bare tarsal in front	0.77	0.08	3.45	4.72	10.13
Eigenvalues	2.86	1.58	—	—	—
Constant	—	—	-934.59	-922.98	—
% variance explained	35.73	19.78	—	—	—
$\bar{x} \pm \text{s.d.}, n$ (<i>madagascariensis</i>)	1.15 $\pm$ 0.52, 21	-0.01 $\pm$ 0.96, 21	—	—	—
$\bar{x} \pm \text{s.d.}, n$ (<i>rutulus</i>)	-0.52 $\pm$ 0.64, 44	-0.01 $\pm$ 1.04, 44	—	—	—
<i>t</i> , df, <i>P</i>	11.28, 47.6, 0.000	-0.07, 42.3, 0.943	—	—	—

TABLE 3.

Summary statistics (mean $\pm$ s.d., *n*) and significance tests (Kruskal-Wallis one-way analysis of variance) for qualitative morphological characters mapped in Fig. 1 for adults of *Otus rutilus* and *O. madagascariensis*. Significance levels as in Table 1.

Variable	<i>madagascariensis</i>	<i>rutulus</i>	Mann-Whitney <i>U</i>
Overall colour (1 = rufous, 4 = grey)	2.68 $\pm$ 0.67, 33	1.86 $\pm$ 0.66, 57	1505.0***
Rim of facial disk (1 = obsolete, 4 = prominent)	3.75 $\pm$ 0.42, 32	1.92 $\pm$ 0.65, 54	1700.0***
Back streaking (1 = obsolete, 4 = prominent)	3.61 $\pm$ 0.57, 33	1.97 $\pm$ 0.72, 56	1750.5***
Coarseness of underparts (1 = coarse, 4 = fine)	3.71 $\pm$ 0.37, 35	2.44 $\pm$ 0.90, 57	1767.5***
Tail banding (1 = vague, 4 = prominent)	3.65 $\pm$ 0.49, 33	2.48 $\pm$ 0.80, 55	1579.0***

TABLE 4.

Summary statistics (mean $\pm$ s.d., n) for measurements of vocal parameters of *Otus madagascariensis* and *O. rutilus*. $F_{\min 1}$ was minimum frequency of lower band, $F_{\max 1}$ maximum frequency of lower band; $F_{\min 2}$ and $F_{\max 2}$ were the same measures for the higher band; Total $F_{\min}$ and $F_{\max}$ were the lowest and highest frequencies, whether the bands were measured separately or not. Analyses were done on means from each tape cut (numbers of individuals taped per site and phrases per individual are given in Appendix 2), which were tested using two-sample t -tests with separate variances; significance levels as for Table 1.

	Taxon		t	Component loadings	
	<i>madagascariensis</i>	<i>ritulus</i>		Factor 1	Factor 2
Number of phrases	6.60 $\pm$ 1.79, 20	6.01 $\pm$ 1.69, 16	0.92 ns	0.35	0.90
Number of notes/phrase	1.78 $\pm$ 0.68, 12	1.02 $\pm$ 0.06, 12	3.88 **	—	—
$F_{\min 1}$	0.34 $\pm$ 0.12, 12	—, 12	—	—	—
$F_{\max 1}$	0.65 $\pm$ 0.21, 12	—, 12	—	—	—
$F_{\min 2}$	0.85 $\pm$ 0.09, 12	0.65 $\pm$ 0.05, 12	7.05 ***	—	—
$F_{\max 2}$	1.32 $\pm$ 0.06, 12	1.11 $\pm$ 0.08, 12	7.21 ***	—	—
Total $F_{\min}$	0.49 $\pm$ 0.17, 20	0.66 $\pm$ 0.06, 16	4.01 ***	0.87	-0.12
Total $F_{\max}$	1.23 $\pm$ 0.16, 20	1.02 $\pm$ 0.18, 16	3.56 ***	-0.83	0.33
Frequency range	0.73 $\pm$ 0.30, 20	0.36 $\pm$ 0.21, 16	4.45 ***	—	—
Phrase length	0.13 $\pm$ 0.03, 20	0.15 $\pm$ 0.06, 16	1.01 ns	—	—
Interval length	0.30 $\pm$ 0.07, 20	0.21 $\pm$ 0.03, 16	5.26 ***	-0.40	-0.16
PCA eigenvalues	—	—	—	1.75	0.96
% variance explained	—	—	—	43.65	24.02
Mean loadings Factor 1	-0.56 $\pm$ 0.89, 20	0.70 $\pm$ 0.63, 16	4.84 ***	—	—
Mean loadings Factor 2	0.25 $\pm$ 0.97, 20	-0.31 $\pm$ 0.97, 16	1.74 ns	—	—

displayed much more faintly on the sonagram than are the primary bands, and appear at *c.* 1.45 to 1.75 kHz.

The song of *madagascariensis* differs from that of *ritulus* in several important respects. The harmonic structure is very strong in *madagascariensis*, and is characterized by two strong bands on the sonagram (Fig. 3). The frequency range is *c.* 0.34 to 0.65 kHz for the lower tone, and *c.* 0.85 to 1.32 kHz for the higher tone. This gives the song of *madagascariensis* a greater overall frequency range, but also causes it to sound lower and ‘gruffer’ to the human ear than in songs of *ritulus*. Furthermore, each phrase of the song of *madagascariensis* consists typically of two, three or more very short notes (homologous to the single-note phrases of *ritulus*), contributing to a noticeable ‘warbling’ quality to the song. Frequently, each short note of *madagascariensis* is also sharply inflected, resembling an inverted ‘V’, in contrast to the flat shape of the notes in *ritulus* (Fig. 3). Compared with songs of *ritulus*, the phrases are slightly but significantly shorter in *madagascariensis*, while the inter-phrase interval is slightly but significantly longer (Table 4).

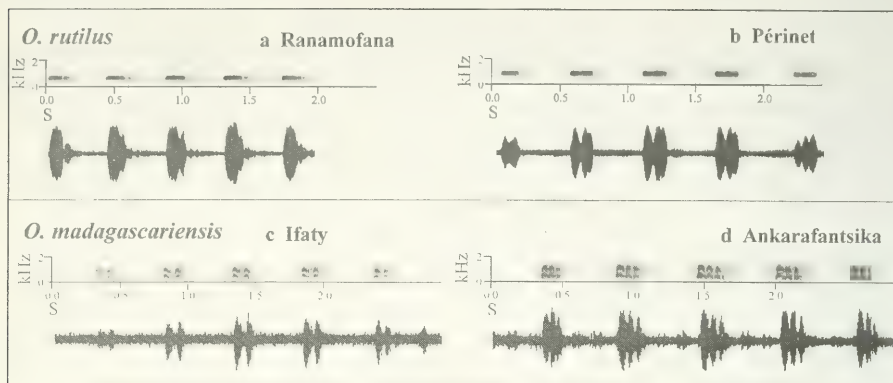


Fig. 3. Sonograms and waveform displays for songs of *Otus rutilus* (a, b) and *O. madagascariensis* (c, d). a) Typical song of *rutilus*: a short series of phrases, each of which consists of only a single flat note (rarely two notes per phrase) without or with very weak harmonics. Recorded at Ranomafana by TSS (LNS 95695). b) Rare variant song of *rutilus*: each phrase consists of a single note, but the waveform display indicates two separate pulses of sound per note, creating a slight audible warbling effect. Recorded without tape playback at Périnet by J. E. Pierson (JEP 091208a). c, d) Typical songs of *madagascariensis*: a short series of phrases, each phrase containing two to four very short inflected notes, each with strong harmonics. Recorded in response to tape playback by TSS, for c) at Ifaty (LNS 87973), and for d) at the Réserve Naturelle Intégrale d'Ankarafantsika (LNS 95648).

Recordings from across large areas of Madagascar (Appendix 2, Fig. 3) show little variation within either of the two vocal types, and little or no evidence of intergradation in vocal characters. In southeastern Madagascar, a relatively well-sampled region, our quantitative analysis reinforces the qualitative impressions discussed by Goodman *et al.* (1997) of an abrupt transition in song type in Malagasy *Otus* across a very steep environmental gradient. However, there are a few exceptions to this generally low level of variability, as follows. Of the several *O. rutilus* (*s.l.*) sound recordings archived at NSA as of 1998, only one did not fit the normal pattern described above: in a recording from Berenty (NSA 35229), one singing bird is an obvious *madagascariensis* while another in the background resembles *rutilus*. Whether the latter was a true *rutilus*, a variant song of *madagascariensis*, or evidence of intergradation is unknown, and the quality of this Berenty recording is too poor to provide quantitative data. We have very few recordings of *Otus* from the High Plateau of central Madagascar; a single recording from Ihosy retains very strong harmonic structure, typical of *madagascariensis*, but the phrases in this song are also comprised of only a single note, typical of *rutilus*. With such a small sample, it is unclear whether this song type represents a pattern in variation across the High Plateau. Songs at Antananarivo and from near Lake Itasy, however, sound to the ear like typical *madagascariensis* (AFAH, pers. obs.). Another region where *madagascariensis* and *rutilus* probably come into contact is in the northwest, where the humid forest of the

Sambirano district is bordered by deciduous forest (albeit of different types) both to the north and south. Our only tape-recorded song from this region, from the island of Nosy Be, has characteristics of both taxa (Fig. 4) but sounds like *madagascariensis*, and several other individuals heard on Nosy Be in secondary habitats also all sounded like typical *madagascariensis* (AFAH, pers. obs.), although the single adult specimen (MNHN 1866-148) from there, collected by Grandidier in 1866, is *O. rutilus*. It is still unclear whether both species occur at Nosy Be, or if *rutilus* has been displaced to some extent by *madagascariensis*, as the rainforest habitat of the former has now been mostly destroyed.

Despite the striking vocal differences between *madagascariensis* and *rutilus*, they escaped notice until C. W. Benson and G. S. Keith called them to J. T. Marshall's attention. Marshall (1978: 19) briefly noted (but did not describe) a geographical component to the distribution of the song types of *Otus rutilus* (*s.l.*), and reported that Keith heard one bird that 'switched from one song to the other.' As discussed elsewhere (Goodman *et al.* 1997: 52), Keith actually heard 'both song types from the same patch of forest' at Fampanombo, near Maroantsetra, northeastern Madagascar, but stated 'We did not see the birds (they were on the other side of a river). So whether these are simply alternative calls made by the same individual, or male-female calls, or what, I don't know' (Keith *in litt.* to TSS, 22 March 1990). The area near Maroantsetra, in the heart of the eastern rainforest, would seem to be an unlikely location in which to find *madagascariensis* or a bird with an intermediate song, and our two recordings from near here, on the Masoala Peninsula, are typical of *rutilus*. However, Maroantsetra is not far north of Ambatovaky, from whence comes another seemingly anomalous record of a 'quintessentially western' species, the White-breasted Mesite *Mesitornis variegata* (Thompson & Evans 1992). In any event, there are no tape recordings of the bird (or birds) heard by Keith at Maroantsetra. Perhaps what Keith heard was a normal *rutilus* and an individual of *rutilus* exhibiting the slightly 'pulsed' effect described earlier.

Type specimens

Otus rutilus

The original description of *rutilus* is a footnote by Pucheran (1849a), who described it as being rather bright russet-red above with black streaks and transverse fawn spots, and having a longitudinal white band across the scapulars, short ear tufts concolorous with the upperparts, and the underparts much paler, each feather with small white bars. He did not say from how many specimens the description was drawn, and the locality was given only as 'Madagascar'. However, Pucheran (1849b) gave a full description of one of Bernier's specimens (now MNHN 1999-892; all MNHN specimen numbers cited herein refer to the 'Catalogue général'), and it was figured in colour (Pucheran 1849b). This specimen also has the annotations on its stand '*Scops menadensis* [a variant spelling of *manadensis*] Q et G.; *Scops rutilus* Puch.; Type; fig. dans les vélins' [figured on a calf skin, J.-F. Voisin, *in litt.*]. The other rufous Bernier specimen (MNHN 1834-90) is now also labelled as a type, but



Fig. 4. Scores for quantitative vocal characters of *Otus rutilus* and *O. madagascariensis* mapped against vegetation zones (as in Fig. 1). In order, from left to right, characters are: number of notes (white < 1.0, black > 2.0); internote interval (white < 0.2, black > 0.3); minimum frequency or total $F_{\min}$ (white > 0.6, black < 0.4); maximum frequency or total $F_{\max}$ (white < 1.0, black > 1.2). Number to left of bar is site number (details in Appendix 2); number to right is n for locality.

it is more saturated rufous and less marked overall (and thus does not match the original description well), as noted by Pucheran (1849b), and on its stand are the words 'Type' and '*menadensis*' (but not '*rutilus*'). Both the Bernier specimens listed above are rufous, and clearly belong to the eastern species. However, because the provenance of both specimens is unknown and could differ, we designate MNHN 1999-892, the bird referred to in Pucheran's (1849a) description, as the lectotype of *Otus rutilus*. Bernier collected in the east and the north-east (Rand 1936), to which general region we restrict the type locality.

Gray (1869) cited the date of Pucheran's (1849b) fuller description and plate as 1844 which, if correct, would have year priority over the footnote that is considered the original description (Pucheran 1849a). However, the date attributed by Gray is almost certainly due to the fact that Vol. 4 of the journal in which Pucheran (1849b) appeared has an 1844 date on the title page, a date which can hardly apply to the later numbers of Vol. 4, as Pucheran (1849a) is referred to in Pucheran (1849b). Vol. 3 is dated 1843, but Vol. 5 is undated, and vol. 6 is dated 1852 (F. E. Warr, *in litt.*), so the appearance of this journal was clearly irregular. In most synonymies, Pucheran (1849b) is simply listed without a date but following Pucheran (1849a), and its true date may be post-1849.

Although Kaup (1852: 229) placed both of Bernier's rufous specimens under *rutilus*, he listed a brown specimen (MNHN 1999.891), also collected by Bernier (but unaccountably not mentioned by Pucheran 1849b) under *manadensis*, although he doubted its Madagascar provenance. This was the original basis for the listing of *manadensis* from Madagascar (and for the consequent lumping of these species); nevertheless, Bernier's brown specimen is clearly a brown morph *rutilus* (with, among other features distinguishing it from *manadensis*, long rectal bristles and larger overall size).

Otus madagascariensis

The only name in synonymy under *Otus rutilus* that could potentially represent the western Malagasy population is *Scops madagascariensis* Grandidier 1867. This species was described (Grandidier 1867a: 85-86) as smaller and distinctly darker than the Tropical Screech-Owl *Otus choliba* (= *brasiliensis*). Grandidier's 1866 expedition took him along the west coast of Madagascar, and in Grandidier (1867a) he stated that the first 12 bird species he described therein (of which *Scops madagascariensis* was the second) were from the southwest coast of Madagascar.

However, no recognized type specimen of *Scops madagascariensis* is present in MNHN, where many (if not all) of Grandidier's bird types are deposited (as well as many of his mammal types, C. & J.-F. Voisin, *in litt.*). Furthermore, Grandidier (1867a) did not indicate upon how many specimens the description was based. There are two mounted scops-owls at MNHN collected by Grandidier, one of which (MNHN 1866-148), a rufous bird collected at Nosy Be, is ruled out as Grandidier's type both on plumage and distribution. The other Paris Grandidier specimen (MNHN 1867-774), a female from the southwest coast, is fairly dark brown, as required by Grandidier's

(1867a) brief description. A third Grandidier specimen (USNM 352819, originally MNHN 1867-773), also from the southwest coast and dated 1867, was exchanged to the USNM in 1886 (J.-F. Voisin, *in litt.*). The original number of the USNM specimen is consecutive with that of MNHN 1867-774 and apparently came from the same voyage. Nevertheless, it is not listed as a type in the USNM specimen catalogue or by Deignan (1961), nor is this designation present on its label, and its pale brown colour does not match Grandidier's description of *madagascariensis*. However, MNHN 1867-774, a typical adult of the southwestern population, is compatible with the description. Although it is labelled only *Scops menadensis*, rather than as a type or as *Scops madagascariensis*, this must be due to the fact that the species' describer had already synonymized it prior to the specimen's arrival in Paris and its being mounted on the stand that bears the data and name. The status at the MNHN of Grandidier's types of *Coua* species (Voisin & Voisin 1999) is consistent with this interpretation: the types of his three valid species of *Coua* have the word 'Type' written on the label and/or stand, while the type of his *C. pyropyga*, long in synonymy, lacks the type designation on its label and stand. We therefore designate MNHN 1867-774 as the name-bearing lectotype of *Otus madagascariensis* (Grandidier 1867).

'Torotoroka' is an onomatopoeic Malagasy name for scops-owl, which, although until now perhaps not strictly applied to western birds, does recall the two-noted, structured song of *madagascariensis* rather than the simple one of *rutilus*. Each 'o' in Torotoroka is pronounced as 'oo', and the 'a' is de-emphasized. We propose 'Torotoroka Scops-Owl' as an appropriate common name for *Otus madagascariensis*. Because of the long-term use of other common names to refer to both taxa, a new English name for *Otus rutilus* is also desirable. We suggest 'Rainforest Scops-Owl' for *rutilus*, which so far as known is confined to this habitat, where it is the island's only scops-owl.

Discussion

Although Grandidier (1867a) correctly named the scops-owl from the southwestern coast of Madagascar as a new species, he did so naively, as he was in Madagascar with few comparative resources, and he did not even mention *rutilus* in his description. Within a few months he became convinced that *madagascariensis* was the brown morph of *Otus manadensis* (Grandidier 1867c).

The earliest series of *rutilus* (*s.l.*) was that collected by Pollen and van Dam for the Museum Pays-Bas (now NNM) between 1865 and 1871. Regional differences in this series were not noted in reviews of the collection (Schlegel & Pollen 1868, Schlegel 1873, Finsch 1898). Specimens of *rutilus* from Pasandava Bay in this series look fairly similar to the Morondava specimens of *madagascariensis*, so the differences would have been easily overlooked, especially since Schlegel (1873) placed them all in *manadensis*. The most obviously different specimen in this collection, a rufous morph *rutilus* collected by Audebert (NNM Cat. No. 14) in an unspecified eastern locality, was acquired only after Schlegel's works.

Sharpe (1875a), despite his detailed descriptions of rufous and brown morph *rutilus*, nevertheless stated that the differences among BMNH specimens were not very considerable. Only seven skins of *rutilus* were then held in the collection, none with specific localities; six of these were collected by Crossley, the other by Pollen in NE Madagascar (Sharpe 1975a). Of the Crossley skins, one is a downy juvenile labelled 'SE', the others adults, one labelled simply 'Madagascar', one 'N', one 'SE', and two (those described by Sharpe 1875a, now BMNH 1875.2.1.9 and 10) as 'SW' Madagascar. The last two, however, are both dark and richly coloured and do not differ from the other *rutilus* for which region of origin is specified in any salient features, and they show all the characters of *rutilus* rather than of *madagascariensis*. The annotation 'SW' was written in a different hand, above the word 'Madagascar', and in a lighter ink, while the designations 'SE' and 'N' must have been written on the labels at the same time as was the word 'Madagascar', as they seem to be in the same hand and ink, and on the same line as 'Madagascar'. The register lacks the designation 'SW' for BMNH 1875.2.1.9 and 10, and as the data would have been entered therein from the labels, the regional annotation was probably added to the labels later that year, since they were published by Sharpe (1875a) as being from the 'SW'. Sharpe's (1870, 1871, 1872, 1875b) relevant papers do not place Crossley in western Madagascar, nor do they include species restricted to the west. Although Sharpe (1875b) noted that when last heard of Crossley was heading toward the west coast, whether he arrived is uncertain (P. Jenkins, *in litt.*), and no letter detailing Crossley's whereabouts accompanied the last shipment (Sharpe 1875b). Since Crossley died in 1870 and his collections were dispersed through dealers (Mittermeier *et al.* 1994), a mix-up with his localities seems highly likely. Scops-owls definitely from southwestern Madagascar do not approach the two Crossley 'SW' birds in morphology, and these two individuals also group with statistical confidence among eastern birds. Thus, Sharpe (1875a) had no true *madagascariensis* available to him for study, and his conclusion of limited variability was based on specimens with apparently incorrect regional designations, which may have misled subsequent researchers as well.

The Archbold-Vernay Expedition (FAA, Mission Zoologique Franco-Anglo-Américaine à Madagascar) resulted in at least 42 new specimens of *rutilus* (*s.l.*) between 1929-1931, which were divided mainly among the BMNH, MNHN, and AMNH. Nine of the 15 FAA specimens that went to BMNH (but none of those that went to other museums) were originally labelled '*Otus scops pallidior*', and were entered as such into the register (F. Steinheimer, *in litt.*). Those labelled as *pallidior* were collected during each of the three years of the expedition, but most of them were pale, finely marked birds from drier western localities, while two *rutilus* were also labelled '*pallidior*'; one of these is a *madagascariensis*-like immature from near Maromandia (BMNH 1931.8.18.362) and, the other, unaccountably, is a typically coarsely marked dark adult from near Anaborano (BMNH 1931.8.18.363). The FAA specimens in the BMNH that are not so marked are all from eastern rainforest localities, and are clearly *rutilus* in morphology. The name '*pallidior*' was apparently

written by W. H. Perrett, a clerical officer (F. E. Warr *in litt.*). It is unclear by whom or on what basis the identifications were made, and this name was not mentioned by Rand (1936) in his treatment of the FAA expedition. On the labels, '*pallidior*' later was crossed out and replaced by '*rutilus*'. It seems that the name '*pallidior*' was never previously published, so it has no taxonomic standing (and its mention herein is intended only as relevant background information, not as formal publication), but its existence on these labels suggests that an unidentified individual who was studying the BMNH series sometime between 1931 and 1936 had recognised differences between eastern and western birds.

There is yet another indication that the morphological variation within *rutilus* (*s.l.*) had previously been perceived as excessive for a single species. Of the three specimens at the ROM, one (ROM 41717) is a typical, richly coloured *rutilus* from Rogez in 1922, while the other two, which were collected in the 1960s from the southwest coast, exhibit classic *madagascariensis* morphology, and differ strikingly from the eastern bird. Both of the south-western specimens (ROM 99472 and 99473) were initially identified as '*Otus* ?n. sp.', but this was then crossed out and replaced with '*Otus r. rutilus*'.

Distribution, habitat and status

Otus rutilus is found, so far as known, only in areas of eastern rainforest habitat (Hawkins 1999), from sea-level to 2,050 m (Figs. 1, 2, 4; ZICOMA 1999). It may be very common, with up to five singing birds audible from one spot (AFAH, pers. obs.), but the degree to which it can withstand habitat alteration is unclear. *Otus madagascariensis*, however, appears to be more adaptable and widespread, being found not only in drier western forests (Figs. 1, 2, 4), but also in trees in villages and other degraded habitats, even on the central plateau. However, there are few records from this region (Dee 1986) and only one such specimen has been examined for this study, from Ivohibe, along the western edge of the rainforest belt. Although its upper altitudinal limits remain to be determined, *O. madagascariensis* is not known from higher elevations. Further field and museum work is needed to establish the full distributions of these taxa and to determine how they behave in zones of potential contact, as well as how they respond to habitat changes.

Other western Indian Ocean island taxa

Because all the following scops-owl taxa have been considered conspecific with *Otus rutilus* (*s.l.*), and because the Mayotte taxon still is, we reconsider the status of all of these taxa based on study of specimens; sonagrams have already been published elsewhere for most of these taxa. All the Comoran taxa differ from both *madagascariensis* and *rutilus* in having the ear tufts not much longer than the surrounding feathers, and in lacking a prominent white supercilium. They differ from *rutilus* in having most of the rear tarsus feathered (Table 1), in their relatively longer

tails, and in having reduced rectal bristles and distal extensions of the auriculars. Compared with *madagascariensis*, they have higher wing/tail ratios, less extensively feathered tarsi, narrower dark tail bands, and less graduated tails. All Comoran taxa (except *pauliani*) have much larger bills, longer wings, and longer tarsi compared with both *madagascariensis* and *rutilus*. All (except *mayottensis*) have relatively small claws, less extensive feathering on the anterior distal tarsi, reduced or missing white scapular spots, and more narrowly banded tails than in the Malagasy taxa.

Otus mayottensis

Adult Mayotte Scops-Owls *Otus* [r.] *mayottensis* resemble some *rutilus*, but their contour feathers are stiffer and not as soft, and the tarsi are more fully feathered along the posterior side than in *rutilus*. Compared to both *rutilus* and *madagascariensis*, *mayottensis* is much larger (Table 1); its throat is more prominently streaked and barred; the background colour of the underparts is darker, with few and irregular pale markings and reduced white patches; and the tarsal feathering is darker. Compared to *madagascariensis*, *mayottensis* has a reduced dark rim to the facial disk; a much darker background colour overall; less prominent streaking on the mantle; and a relatively short and less strongly banded tail. Two previously mentioned distinctions between *mayottensis* and *rutilus* (s.l.), the apparent presence of more white around the face and a more prominent buffy collar in *mayottensis* (Benson 1960), are largely due to differences in preparation style. A third perceived difference mentioned by Benson (1960), the less bold black streaking below in *mayottensis*, is due to the darker ground colour of its underparts. The song of *mayottensis* is most similar to the two Madagascar species, but is lower and deeper, with longer notes that lack internal structuring and harmonics (Lewis 1998; NSA 51549). Thus, although *mayottensis* is clearly closely related to *rutilus* and *madagascariensis*, all three are probably better treated as full species, and we suggest for the former the common name of Mayotte Scops-Owl, essentially as already used by Lewis (1998). *Otus mayottensis* exists down to sea level in disturbed woodland and mangroves (Louette 1988, Hornbuckle 1997).

Two scops-owls from Mayotte in Paris are labelled as types of '*Scops humbloti*' Oustalet. However, Benson (1960) was unable (as were we) to locate any published use of this name and, since '*humbloti*' was neither used by Milne-Edwards & Oustalet (1888) nor listed in their synonymy, Benson (1960) described *mayottensis* as new. Benson (1960) could locate only one (MNHN 1884-2065) of the two specimens registered into the Paris collection as '*humbloti*', but the second specimen (MNHN 1884-2066) was found by PCR in the MNHN mounted collection. It is labelled '*Scops Humbloti* Oust., Humblot, Mayotte', with only the 'T' of what was evidently the word 'Type' still legible. This immature *mayottensis* has finely patterned underparts and prominently banded tertials and tail, and thus (as with immature *rutilus*) resembles *madagascariensis* more than do adults of *mayottensis*.

Otus capnodes

The Anjouan Scops-Owl *Otus capnodes* differs from *rutilus*, *madagascariensis*, and *mayottensis* in having very soft, usually darker, plumage with less streaking and more prominent, more even barring overall; longer fluffier crown feathers, nearly eclipsing the ear tufts; the facial disk either plain whitish, whitish with fine concentric dark rings, or (in blackish individuals) all-dark, with a prominent blackish outer rim; the auricular extensions sparse and short; very narrow banding on its rather long, square tail; and long tarsi (Table 1) that are much less extensively feathered along the front, but much more heavily and fully feathered along the rear; relatively small claws; and a mostly pale horn bill with darker cutting edges. In addition, in those *capnodes* that have scapular spots, these are inconspicuous, buffy, and narrowly barred dark. The immature plumage of *capnodes* is more similar to adult plumage than in the foregoing species. *Otus capnodes* is morphologically much more distinct from *mayottensis*, *madagascariensis*, and *rutilus* than any of these are from each other. Its song is also very different, being a whistle quite unlike the songs of other scops-owls (Safford 1993).

Despite Gurney's (1889) good description of *capnodes*, Finsch (1898) considered it identical to *rutilus*, an ill-considered decision (very likely due to Finsch's self-acknowledged lack of *capnodes* specimens) that nevertheless has influenced taxonomy to the present. Many of the Leiden scops-owl mounts have lost some of their tarsal feathering, probably due to preparation techniques. This, and the existence of a very dark specimen of *madagascariensis* at NNM, may have led Finsch (1898) to discount the specific value of the different leg feathering and dark colouration that Gurney (1889) had noted. Perhaps adding to the confusion, in the Rothschild Collection (now at AMNH) there were three *capnodes* labelled as being from Madagascar, and while they were correctly identified to taxon the regional designation had not been marked as questionable.

At least 47 specimens of *Otus capnodes* exist (AMNH 8 [not 4 as stated by Benson 1960], ZMUC 2, BMNH 12, USNM 3, SMF 1, ROM 2, MCZ 1, MNHN 17, LIVCM 1 [see *O. pauliani*]), and the absence of strongly rufous birds among this sample suggests that such a morph either does not exist or is very rare. However, a blackish-brown morph seems common, being represented by about 12 specimens.

The selected syntype of *capnodes* (BMNH 1955.6.N.20.3848) was said to be 'Coll. by G. A. Frank' (Warren 1966: 51). However, *capnodes* was probably collected only by Humblot (Benson 1960), and the unmounted specimens all resemble each other in preparation. As independently noted by Benson (1999), G. A. Frank, Jr. was a dealer who bought up many of Humblot's Comoro duplicates (Sharpe 1906: 354), and the selected type is a remade mount from the Norwich Museum. Incidentally, there are two other syntypes at BMNH, and the Cambridge collection also holds two syntypes of *capnodes*, which have their labels annotated 'Humblot through Franck [*sic*], 1888'. Also, the listing of the type locality of *capnodes* as 'from forest of E. Imerina; Anjouan' (Knox & Walters 1994: 170) erroneously incorporates a Madagascar locality, and should read simply 'Anjouan'.

Otus moheliensis

The recently described Moheli Scops-Owl *Otus moheliensis* (Lafontaine & Moolaert 1998) seems morphologically intermediate between *capnodes* and *mayottensis*. It is similar in size to *capnodes*, but differs from it having a bright rufous morph; stiffer, more compact plumage; short eartufts and crown feathers; more streaking and little or no barring above; nearly unicoloured underparts with greatly reduced pale bands; much shorter and less dense feathering on the rear tarsus; and an all-dark upper mandible. *Otus moheliensis* is larger (Table 1) than either Madagascar species but smaller than *mayottensis*, and differs from all three in having short eartufts; reduced rectal bristles and distal extensions to the auriculars; little streaking below; small, barred scapular spots; paler tertials; and less extensively feathered tarsi. Compared only to *mayottensis*, *moheliensis* has a much more prominent black rim to the facial disk; warmer, more saturated overall colour in the brown morph; paler background colour above and more prominent overlying dark markings; and weaker claws and feet. The typical song of *moheliensis* is evidently a sequence of hisses, and it also gives a screech call much like that of *capnodes* (Lafontaine & Moolaert 1998).

Otus pauliani

The Grand Comoro Scops-Owl *Otus pauliani* is much the smallest of the group, with a very small bill and short wings (Table 1). It resembles *capnodes*, with soft and lax plumage, no prominent eartufts but long crown feathers, and full, fluffy feathering on the rear edge of the proximal half of the tarsus. However, compared to *capnodes*, its head is much more barred and greyish; its rectal bristles are profuse but fairly short, its facial disk is rudimentary with very decomposed and fluffy auricular feathers, and lacks a dark rim; the body is finely and evenly barred with blackish on a buffy-ochre background, with some whitish barring below; the tarsal feathering is barred dark; the bill is dark with a pale tip and gonys ridge in the skin; and the claws are about half dark. Five individuals seen and/or photographed had dark eyes (Herremans *et al.* 1991), while the iris colour of the type specimen was recorded as being yellow, and one photographed had yellowish eyes (Lewis 1996).

Only a single specimen of this species was ever collected, and it is an immature, but a living individual photographed by Lewis (1996) closely resembles this specimen. The song of *pauliani*, which is a very long series of 'chaw' notes repeated at about 2/sec, is highly distinct from those of any of the other taxa (Benson 1960, Herremans *et al.* 1991, König *et al.* 1999), and hence this bird must be treated as a distinct species. It was originally treated as a subspecies of *rutilus* only in deference to the opinions of others (Benson 1960: 61). Its upper montane (c. 1,000-1,850 m) forest-heathland habitat is also unusual for the group; although *rutilus* has now been found up to 2,100 m (ZICOMA 1999), at higher elevations it occurs in montane forest, not heathland.

An *Otus* specimen (LIVCM T13096) was labelled and published as having been collected on Grand Comoro by Humblot in 1886 (Tristram 1889). PCR compared the 'Grand Comoro' bird directly with the entire BMNH holdings of *capnodes*

(including the unique type of *pauliani*), and in all respects it is clearly *capnodes*. It appears typical in external preparation style to Humblot's large Anjouan series. In addition to re-copied museum labels, the 'Grand Comoro' specimen bears what appears to be an original label, but the handwriting and content thereon does not closely match that of Anjouan *capnodes* specimens at BMNH, for which the 'original' labels vary depending on the dealer (Frank or Boucard) from whom they were obtained. At MNHN, the official 'C.G.' labels are the only labels on 11 *capnodes* specimens, with the writing and content different yet again. This suggests that Humblot's specimens may not have been labelled until after their dispersion and, if so, a mistaken attribution of this specimen to Grand Comoro, on which Humblot collected during the same time period (Benson 1960), could have easily occurred. As Milne-Edwards & Grandidier (1888) listed no scops-owl for Grand Comoro, they must either have been unaware of this specimen record or dismissed it without published comment as erroneous. This anomalous record was also overlooked in the description of *pauliani* (Benson 1960). It seems improbable that typical *capnodes* occurs on Grand Comoro in sympatry with the montane *pauliani*, and even in the unlikely case of a now-extinct or overlooked lowland form occurring there, its identity with *capnodes* would seem doubly improbable given the high level of differentiation in these and other Comoran taxa. We thus presume that the locality must be erroneous.

Otus pembraensis

The Pemba Scops-Owl *Otus pembraensis* is highly distinct in many ways, although this has usually not been recognized (Pakenham 1937 and most subsequent authors, but see Pakenham 1939). It is almost unstreaked ventrally in any morph, instead being very finely vermiculated below, with broad, even rufous bands on the lower underparts (the bands coalescing in the saturated red morph); it has a 'grey' morph that is heavily rufous-washed below, and is solid rufous above; and the plumage is relatively stiff and compact. The rectal bristles and auricular extensions are very short (Table 1); the facial disk is paler, especially anteriorly, but the black disk rim is very pronounced, and a patch around the eye is very dark; the ear tufts are short and scarcely marked; the crown feathers are short; the scapulars have small white to buff scapular spots, covering only part of the outer web, and with small black tips and narrow mesial edges; the primaries are mostly plain, edged with tiny white spots and with narrow bands on the inner webs; the central rectrices and tertials are completely unbanded; the stout tarsi are very thickly feathered to well below the tarsal joint, both front and back; and the tarsal feathering is barred. The wing differs from the other taxa dealt with herein (as well as from the entire Moluccan Scops-Owl *Otus magicus* group) in having longer outer primaries (e.g., shorter primary shortfalls; Table 1). Its bill is deeper, more arched, and yellow with only the tip dark, and its claws are large and mostly pale. The downy juvenile plumage differs from those of *rutilus* and *madagascariensis* (the only other taxa of *O. rutilus* [*sensu* Marshall 1978] in which this plumage is known) in being scarcely and very vaguely barred below.

Benson (1960) remarked on the similarity of the song of *pembaensis* to that of *Otus rutilus*, but this must be taken in the context that he was comparing his own field experience (without benefit of recordings) on Mayotte and Madagascar with the brief description of vocalizations provided by Pakenham (1937). The simple, monotonous song of *pembaensis* at least superficially resembles those of Malagasy species, but the unstructured notes of c. 0.25 sec in duration are uttered singly at long and irregular intervals (NSA tape by A. Perkin; König *et al.* 1999). The nearest relative of *Otus pembaensis* is unclear but there is little or no external morphological evidence indicating this to be *rutilus*, *madagascariensis*, or any of the Comoran forms, despite tacit agreement among previous authors that *pembaensis* belongs to the *rutilus* superspecies.

Otus insularis

The Seychelles Scops-Owl *Otus insularis* has for twenty years usually been treated as a subspecies of a widespread, polytypic *O. magicus* (Marshall 1978), but this is unwarranted on morphology and biogeography (Rasmussen 1998). *Otus insularis* differs from all Malagasy and Comoran taxa in having the ear tufts mostly buff with black scribbles near the tips; the short auricular feathers completely without distal extensions; the underparts very broadly streaked; the tarsi long, heavy, and feathered only at the very top; large feet; and a relatively short tail. It resembles the northern Comoran taxa, however, in having broad ear tufts that are scarcely discernible among the long, fluffy head feathers. The downy fledgling of *insularis* is broadly dark-banded on a buffy background (vs. typically narrowly banded on a whitish background in *Otus magicus* ssp.). The possibility that the relationships of *insularis* are with other western Indian Ocean taxa should be reconsidered. However, no morphological characters distinguish all taxa formerly treated as races of *Otus rutilus* (*sensu* Marshall 1978) from the *Otus magicus* group. While the sister-species of *insularis* is unclear, its vocalizations are similar in quality only to *O. magicus* (Marshall 1978; König *et al.* 1999).

Conclusion

The vocalizations and morphology of all the *Otus* taxa from western Indian Ocean islands shows that each small-island population and the Malagasy species-pair have evolved different advertising and territorial songs that would almost certainly preclude regular interbreeding, as well as distinctive morphologies. The scops-owls of this region, despite their largely allopatric distributions, require treatment as eight separate species (*rutilus*, *madagascariensis*, *mayottensis*, *moheliensis*, *pauliani*, *capnodes*, *pembaensis*, *insularis*) under the Biological Species Concept. The taxa of the northern Comoros are well-differentiated and have probably been isolated a long time from those to the south, while the relationships of the highly distinct Pemba and Seychelles scops-owls require re-evaluation.

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Appendix 1. Localities and coordinates for skin and fluid specimens included in analyses and mapped in Fig. 1 and 2. Localities are ordered from north to south on the west side of Madagascar, then from north to south on the east. For some localities, adult specimens were not studied, and thus they do not appear in the summary statistics. Under 'Remarks', citations in parentheses are published, while those without are collectors and year of collection.

Site No	Name	Coordinates	Remarks
1	Anaborano	13°32'S, 48°50'E	'western in character' (Rand 1936)
2	Mahajunga/Bombetoka	15°43'S, 46°19'E / 15°50'S, 46°15'E	?/van Dam 1870
3	Anaboratabe	c. 16°00'S, 46°05'E	valley with palms and deciduous forest (Rand 1936)
4	Namaroka	16°05'S, 45°21'E	gallery and deciduous plains forest (Rand 1936)
5	Andranolava	16°10'S, 47°58'E	(Kaudern 1922)
6	Tsiandro	18°42'S, 44°53'E	scattered trees, some heavy hill forest (Rand 1936)
7	Morondava	20°19'S, 44°17'E	van Dam 1871
8	Ankasoabo/Tabiky	22°17'S, 44°31'E	Ljungqvist 1929
9	3 h N Ivohibe	22°28'S, 46°53'E	Ankerana, forest edge (Rand 1936)
10	Anavelona	22°40'S, 44°11'E	Goodman 1999 (pers. comm.)
11	Sakaraha/Zombitsy	22°54'S, 44°31'E/ 22°51'S, 44°43'E	song a harsh, guttural 'k-r-r-k' in a series of 4-5 (Benson <i>et al.</i> 1976)/ edge of savannah & wet-dry forest, Goodman 1993
12	Sarodrano	23°31'S, 43°45'E	'scrub at base of cliffs', Peterson <i>et al.</i> 1967
13	Antinosy	c. 23°25'S, 44°45'E	J. T. Last (Collar & Tattersall 1987); not 'Loast' as on AMNH specimen labels
14	Lac Tsimanampetsotsa	24°08'S, 43°45'E	one found in a limestone cave (Rand 1936)
15	Amboasary	25°10'S, 46°15'E	Bluntschli 1931
16	Mt. des Francais	c. 12°40', c. 49°00'	Melou 1917 (not precisely located)
17	Nosy Be	13°20'S, 48°15'E	Grandidier 1866-67
18	Ambodavy/ Pasandava Bay	c. 13°40'S, 48°15'E/ c. 13°40'S, 48°15'E	= Ampasindava; see Collar & Stuart (1985)
19	1 day S Anaborano	c. 13°32'S, 48°50'E	in humid evergreen forest (Rand 1936)
20	Antanambao	14°01'S, 48°25'E	Goodman 1999 (pers. comm.)
21	1 day E Maromandia	c. 14°13'S, 48°05'E	both forest and non-forest in area (Rand 1936)
22	1 day W Andapa	c. 14°39', 49°40'E	mountain forest and open areas (Rand 1936)
23	Andapa	14°39', 49°40'E	brush and mountain forest (Rand 1936)
24	near Maroantsetra	15°23'S, 49°44'E	heavy forest (Rand 1936)
25	Mahambo	17°29'S, 49°28'E	Newton 1865
26	Sianaka	c. 18°S, 49°E	Herschell-Chauvin 1925-7, Devolle 1949-52
27	Didy	c. 18°05'S, 48°30'E	Deignan 1962
28	Beforona /Rogez/ Périnet/Imerina	18°58'S, 48°35'E/ 18°48'S, 48°37'E	Lamberton 1922-23; Benson, Wills 1892-96

		18°56'S, 48°25'E/ c. 19°00'S, 48°00'E (last site not precisely located)	
29	c. 43 km S Ambalavao	22°13'S, 47°00'E	Goodman 1993
30	30 km W Vondrozo	22°50'S, 47°20'E	FAA 1929
31	Marosohy Forest	24°34'S, 46°48'E	closed-canopy forest, Goodman 1989
32	Mandena Forest	24°58'S, 47°01'E	littoral forest, Schulenberg 1989
33	near Tolagnaro (Ft. Dauphin)	c. 25°02'S, 46°00'E / 24°59'S, 46°56'E	Milon 1948/ Goodman 1990

Appendix 2. Localities and coordinates for vocalizations included in analyses, ordered as for Appendix 1. Summary statistics were analysed from means for each individual tape cut, so number of phrases per individual is number of replicates for each.

Site No.	Name	Coordinates	Analysis by:	Species	No. phrases/ individual
1	Nosy Be	13° 20'S, 48° 15'E	RV	<i>madagascariensis</i>	6
2	Karambao	16° 13'S, 46° 56'E	TSS	<i>madagascariensis</i>	5
3	Ampijoroa	16° 15'S, 46° 48'E	TSS, RV	<i>madagascariensis</i>	6, 10
4	Ankorokaroka	16° 16'S, 47° 03'E	TSS	<i>madagascariensis</i>	5
5	Namoroka	16° 05'S, 45° 21'E	RV	<i>madagascariensis</i>	11
6	Analamaintso	18° 20'S, 47° 07'E	RV	<i>madagascariensis</i>	6
7	Tsimembo	18° 13-19° 07'S, 44° 34-57'E	RV	<i>madagascariensis</i>	9
8	Ihosy	22° 24'S, 46° 07'E	TSS	<i>madagascariensis</i>	8
9	Isalo	22° 33'S, 44° 23'E	RV	<i>madagascariensis</i>	5
10	Zombitse	22° 48'S, 44° 40'E	TSS, RV	<i>madagascariensis</i>	5, 7
11	Ifaty	23° 06'S, 43° 37'E	TSS	<i>madagascariensis</i>	5
12	Andohahela Parcel 2	c. 24° 48'S, 46° 30'E	RV	<i>madagascariensis</i>	5
13	Hazofotsy	24° 49'S, 46° 33'E	TSS	<i>madagascariensis</i>	7, 8
14	Berenty	c. 24° 59'S, 46° 17'E	TSS	<i>madagascariensis</i>	5, 6, 6
15	Hiaraka	15° 29'S, 49° 56'E	TSS	<i>rutilus</i>	5
16	Ambanizana	15° 41'S, 49° 57'E	TSS	<i>rutilus</i>	5
17	Kalotsara	17° 42'S, 48° 46'E	TSS	<i>rutilus</i>	7
18	Rangovallo	c. 17° 26-44'S, 48° 56-59'E	RV	<i>rutilus</i>	6
19	Maninilaza	c. 17° 26-44'S, 48° 56-59'E	RV	<i>rutilus</i>	5
20	Reserve Speciale d'Analamazaotra (Périnet)	18° 28'S, 48° 28'E	TSS, RV	<i>rutilus</i>	5, 5, 7
21	Parc National Ranomafana	21° 16'S, 47° 26'E	TSS	<i>rutilus</i>	5, 4
22	Manombo	23° 02'S, 47° 44'E	TSS	<i>rutilus</i>	5, 6
23	Andohalela Parcel 1	c. 24° 36'S, 46° 42'E	RV	<i>rutilus</i>	8
24	Mandena Forest	24° 58'S, 47° 01'E	TSS	<i>rutilus</i>	11, 7, 7, 7

Notes on the status and nesting ecology of Fernandina's Flicker *Colaptes fernandinae*

by A. D. Mitchell, A. Kirkconnell & L. J. Wells

Received 16 October 1988

Cuba has 23 endemic birds, of which 11 are considered threatened (Collar *et al.* 1992). This situation prompted the authors to study the threatened species over a four-month period in 1995, in order to define the problems faced by the birds and to develop workable conservation plans. The threatened endemic woodpecker Fernandina's Flicker *Colaptes fernandinae* was one of the most closely-studied species. This paper sets out our findings and proposes some conservation measures.

Historical status

Fernandina's Flicker seems never to have been abundant. It does, however, appear to have formerly been more widespread (Figs. 1 & 2). D'Orbigny (1839) and Malherbe (1862) wrote that it was quite rare while Gundlach (1871–1875) stated that it was locally common. Barbour (1923) judged it 'very rare' but later (1943) said that it 'is locally abundant only . . . in southern Santa Clara and Camagüey'. Gundlach asserted that the species did not occur in Oriente province but there are 48 specimens in museums, all collected between 1884 and 1910, from the area around Guantánamo. Ridgway (1914) recorded examples from Havana (probably erroneously) and from San Diego de los Baños in Pinar del Río province, which is close to currently occupied locations. Barbour collected over 20 specimens between Rodas and Aguada de Pasajeros in Cienfuegos province, where the species is still to be found today. He also saw 'quite a number' near Trinidad and along the south coast of Camagüey. Ruten (1934) considered it locally common in central Cuba.

Later, Bond (1956) agreed that it was locally common and even numerous in suitable habitat in Las Villas and Camagüey provinces. In 1971 he stated that it was not an endangered species, contrary to Vincent (1966–1971). By 1977 Garrido and García Montaña judged it 'fairly rare' and in 1991 M. Lammertink reported (*in litt.*) that O. H. Garrido and A. Kirkconnell estimated a total population of 300 pairs in three separate areas. They also felt that it was in sharp decline. Any contact with the species demonstrates that it is large, noisy (in the breeding season) and not particularly shy of man, and therefore not difficult to find in suitable habitat. However, the suitable habitat for the bird appears to have declined alarmingly. The species is now only found with certainty in a limited number of areas and was treated as endangered by Collar *et al.* (1992). The up-to-date distribution of the species, following the Catalogue of Cuban Birds (Garrido & Kirkconnell *in press*) is as follows:



Figure 1. Current range of Locations where *C. fernandinae* recorded:

1. Mil Cumbres. 2. Norte. 3. Soroa. 4. Loma del Taburete. 5. Cayajabos. 6. Nueva Paz. 7. Ciénaga de Zapata. 8. Bermejas. 9. Corallillo. 10. Aguada de Pasajeros. 11. Rodas. 12. Isabela de Sagua. 13. Sierra de Najasa. 14. La Belén. 15. El Chorrillo. 16. El Recreo. 17. Campos de Veloso. ----- Province border.  Ciénaga de Zapata.

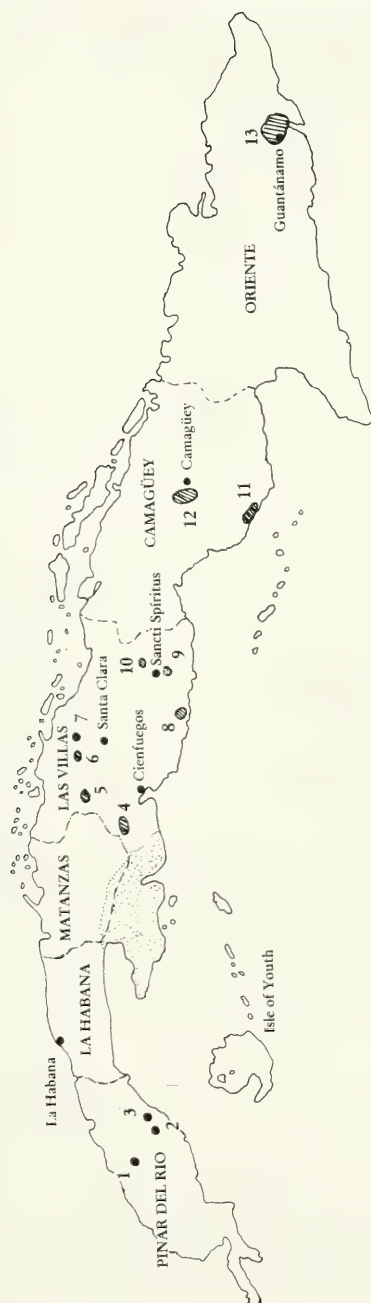


Figure 2. Historical range of (1878– 1948). Location, year and approximate number of *C. fernandinae* recorded/ collected:

1. San Diego de los Baños (1900). 2. Taco Taco (1916). 3. San Cristobal (1878 & 1933). 4. More than 20 specimens (1915 & 1943). 5. 'Common' (1934). 6. 'Common' (1934). 7. 2 specimens (1928). 8. Trinidad (1923 & 1943). 9. 'Common' (1934). 10. 'Common' (1934). 11. 1923 & 1943. 12. 1913, 1925, 1933 & 1948. 13. 48 specimens (1884– 1919). ----- Province border. □ Cienaga de Zapata.

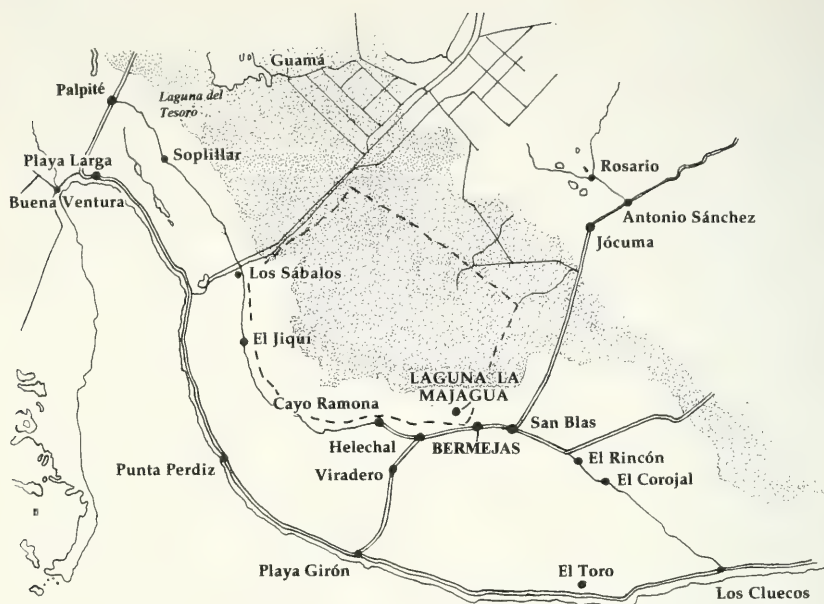


Figure 3. Study site in the Zapata Swamp. The area enclosed by a dashed line is the area in which Fernandina's Flickers were counted. □ Wet swamp.

Pinar del Rio province: Sierra del Rosario; in particular Soroa, Mil Cumbres, Nortey, Loma del Taburete, Cayajabos.

Havana province: Nueva Paz.

Matanzas province: Zapata Swamp; in particular Los Lechuzos, Mera, Santo Tomaás, Bermejás, Los Cristales, Helechal.

Villa Clara province: Near Corallilo, El Dorado, Isabela de Sagua.

Cienfuegos province: Aguada de Pasajeros, Rodas.

Camagüey province: La Belén (Sierra de Najasa), El Chorrillo.

Holguín province: Campos de Veloso near Gibara, El Recreo near Velazco.

A particular congregation of nesting birds occurs in the Zapata swamp just north of Bermejás at Laguna de la Majagua (see Fig. 3) and was the focus of this study.

Methods

Observations and measurements of each nest site were made during 84 man-days over a five-week period from 8 April to 12 May 1995 at Laguna de la Majagua and the surrounding area. La Majagua has been a breeding site for several pairs since at

TABLE 1
Nest site measurements (linear values are in metres)—see Fig. 4

Measurement	<i>n</i>	Range	Mean
Tree diameter at chest height	7	0.95–1.43	1.24
Nest entrance height	7	3.08–6.13	4.37
Horizontal entrance diameter	7	0.08–0.11	0.091
Vertical entrance diameter	7	0.07–0.1	0.084
Cavity depth	7	0.3–0.98	0.59
Diameter inside entrance	7	0.27–0.32	0.294
Number of trees	7	9–22	14.14
No. of tree and shrub species	7	6–13	9.71

least 1986 (Jackson 1991). Behavioural observations are the subject of a separate paper. The following details were noted in the 0.05 ha area surrounding the nest; diameter of nest tree at chest height; number of trees >30 cm at chest height; number of different species of tree and shrub. This gave a measure of the habitat in the vicinity of the nest site and can be easily compared with other nests in the future.

The following measurements were also taken for each nest: height of nest entrance above the ground; horizontal diameter of nest entrance; vertical diameter of nest entrance; depth of nest cavity; internal diameter of nest at entrance.

The aggregation of nesting birds, as found at Laguna de la Majagua, is not known to occur anywhere else although similar sites appear to occur in the area surrounding Bermejas. However, Fernandina's Flickers nest elsewhere within the dry woodlands along the coast and a count was made within the area outlined in Fig. 3 to give an estimate of the number of pairs in the area. This was done by noting nests found during studies of other threatened species in the area and by a series of walks along the many pathways through the woods. These walks were standardised to 1 h out and 1 h back by the same route to ensure that the observer did not get lost.

Discussions were held with Orlando Ramirez, the forest guard for the area between Playa Larga and Bermejas, to obtain local knowledge of, and threats to, the species as well as learning how local use of the area might affect Fernandina's Flicker's survival.

Results

Nest site measurements

Seven nests were measured and the surrounding habitat surveyed as described in Methods. The results are summarized in Table 1.

Each nest was in a dead palma cana *Saval parviflora* (Fig. 4) and most of the trees in the sample plots were also of this species as a result of the area having been cut over (see Discussion for more detail). A complete botanical list in the vicinity of

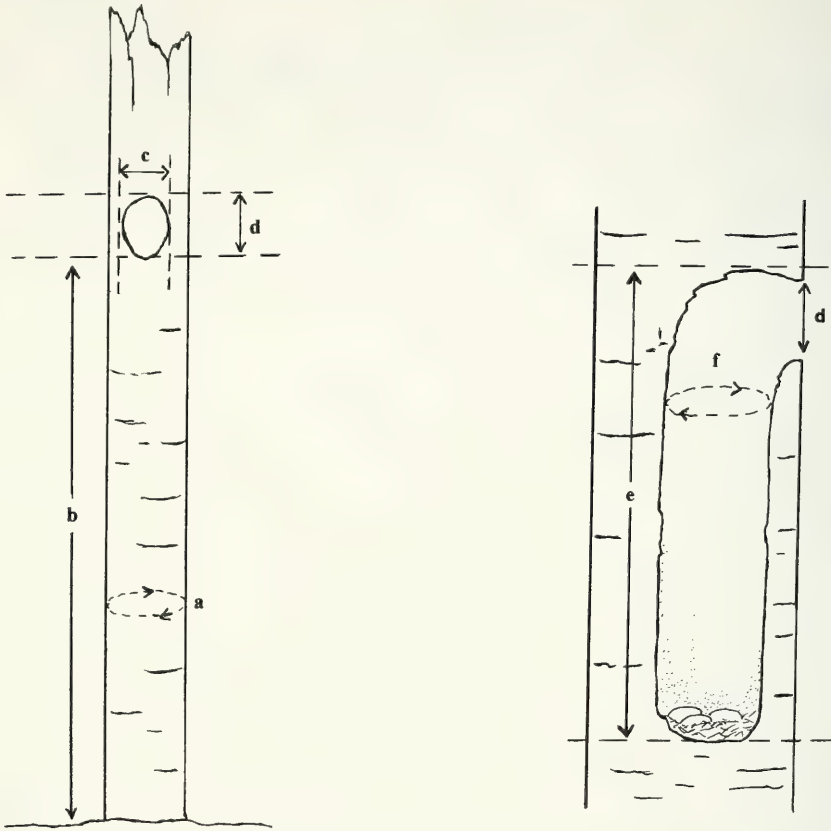


Figure 4. Typical nest of *Colaptes fernandinae* in dead palm tree.

Left—position in tree. Right—cross section of nest. Average measurements of nest: a. Diameter of nest tree at chest height. 1.24 m. b. Height of nest entrance above ground. 4.37 m. c. Horizontal diameter of nest entrance. 9.1 cm. d. Vertical diameter of nest entrance. 8.4 cm. e. Depth of nest cavity. 0.59 m. f. Internal diameter of nest at entrance. 29.4 cm.

each next was not possible, but other species of tree recorded were royal palm *Roystonea regia*, jucaro *Bucida palustris* and soplillo *Lysiloma latisiliquum*.

Census walks

Nineteen census walks were conducted as described in Methods during the study period and Fernandina's Flicker was recorded on 12 of these, either as single birds or pairs, with or without a nest. Twenty four birds were noted, of which 20 were observed as pairs. For the purposes of this census, the four sightings of individuals is assumed to represent a pair of birds based on the fact that the records were made during the

breeding season. Each registration of a bird or pair was remote enough from any other to assume that no bird was counted twice. Together with the birds at Laguna de la Majagua and other casual records, a total of 30 pairs is assumed, made up from 10 pairs recorded on the census walks, four individuals assumed to be halves of pairs, seven pairs at Laguna de la Majagua and nine pairs noted away from these areas whilst doing other work.

Local knowledge

According to Orlando Ramirez, the habitat comprises three zones. The first is a coastal zone varying in width between one and three kilometres characterized by low plant species diversity and a height of around 5–7 m. This zone also has almost no palm trees. The next zone is known as *costanera* and is approximately the same width but has a greater species diversity and height up to 10 m or more. Importantly, it holds a great number of palm trees, mainly of *palma cana*. The difference between the coastal zone and *costanera* appears to be simply due to soil depth on top of the limestone bedrock. The innermost zone is the swamp proper, dry grassland from November to May, inundated in the wet season and punctuated here and there with islands of trees and shrubs. Fernandina's Flickers were observed only in the *costanera*, in which La Majagua is located.

Threats

The entire Zapata Peninsula is a protected area (Scott & Carbonell 1986) and an area of some 10–12 km² around La Majagua has been designated a 'special protection area'. However, the protection is only effective when there is a forest guard in the area and Ramirez commented that his workload had been greatly increased since 1994, and there was no fuel for his motorcycle so that he was unable to patrol the area effectively.

There are several other species which nest in holes in palm trees and could therefore be in direct competition with Fernandina's Flicker; West Indian Woodpecker *Melanerpes supercilialis*, Cuban Green Woodpecker *Xiphidiopicus percussus*, Northern Flicker *Colaptes auratus*, Cuban Trogon *Priotelus temnurus*, Cuban Parrot *Amazona leucocephala*, Cuban Parakeet *Aratinga euops*, American Kestrel *Falco sparverius* and Cuban Blackbird *Dives atrovioleacea*. Of these, the other three woodpeckers might be expected to compete directly, and in particular the con-generic Northern Flicker (Short 1982).

There were 1–3 pairs of Northern Flickers in the study area throughout the period but only the West Indian Woodpecker was seen to interact with Fernandina's Flicker, entering a nest on several occasions, once seen to leave with an egg and once with a chick. Three pairs of West Indian Woodpeckers were recorded nesting in the study area including one pair in the same tree as a Fernandina's Flicker nest but some 2 m lower down, the entrance being on the other side of the tree.

The human threats to the species and its habitat come from two main sources: clear felling of areas for food production and pushing over of nest trees (dead palms)

by people looking for Cuban Parrot chicks to sell. Woodcutting is managed by the Empresa Forestal within the park and has a strict strategy—all the species of tree within the swamp are cut for various uses except for palm trees. Only the leaves of these may be cut. Felling is done in small areas to minimise the effect on wildlife. How often an area is cut depends on the usage; wood for charcoal can be re-cut after 11–12 years but it may be 20–30 years for other uses. Uncontrolled fires only occur in the swamp proper, not in the costanera.

Wholesale clearance of an area is illegal but, according to Ramirez, the authorities often take no action because they know that people need more food. There are very real shortages in the villages of the swamp. The problem of the destruction of dead palm trees means that not only are broods or clutches lost (any palm tree with a nest hole in it is pushed over) but that tree is lost forever as a nest site. During the period of our fieldwork, three trees were destroyed in this way at La Majagua, two of which held Flicker nests and one, an American Kestrel nest. As mentioned above, there are not the resources for policing the area effectively which means that the birds are coming under increasing pressure.

Discussion

Our study sheds some light on the reasons for the species' decline and provides some ideas both for conservation measures and for further studies.

The survey of the nesting habitat provides baseline data for comparison with nests other than those in the 'group'. The presence of dead palm trees, especially palma cana, appears to be a necessity; nests have not been reliably recorded in any other situation.

The other features of La Majagua that we consider are important for a species that is primarily a terrestrial feeder, i.e. proximity to water in the dry season, soft ground and low secondary growth, are not present together where pairs nest singly. It is therefore possible that it is these features which have encouraged the birds to nest so close together. It is equally possible, however, that this is a traditional nesting site where the cutting-over (approximately five years before these observations) did not completely destroy its appeal for the birds. Perhaps they nested at this density in former times. Another possibility is that the dead palms were sufficiently old and weakened by insects and fungi to make them significantly easier to excavate for nest holes.

It is difficult to estimate the number of pairs of Fernandina's Flickers because they are sparsely and apparently randomly distributed throughout the dry woodlands. It is not possible, for instance, to say that the concentration of pairs at La Majagua is repeated anywhere within the swamp. However, this study located 30 pairs of birds and a crude estimate for the area between Los Sabalos and Bermejas (see Fig. 3) would be 60 pairs. Fernandina's Flicker is found in other parts of Zapata and the authors' experience suggests that there are probably only 100–120 pairs left overall, compared with the 1991 estimate of 300 pairs. If these estimates really indicate that

a decline of this magnitude has occurred in four years, in the area that is considered the stronghold for the species, then conservation action is urgently required.

Our suggested solution comes in two parts: the first is education. A poster campaign through the villages in the area would bring home to the local people the importance and vulnerability of some of the species (not only Fernandina's Flicker) that live around them. Because they see these birds, in some cases, every day, the local people are not necessarily aware of their status. A noisy flock of up to 40 Cuban Parrots can be seen daily in Bermejas and it is difficult to convince people that this is an endangered bird. Secondly, we consider that a nest box scheme should be tried. We have a range of measurements for nest holes so that a suitable box could be constructed. The boxes should be fitted securely to live palm trees, both within and close to the existing nesting area. If the birds use them, there will be two benefits; the nesting area could gradually be enlarged (and during this we may learn something of what constitutes unsuitable nesting habitat) and it is not possible to push over live palms. The authors are currently seeking funding for the nest box scheme.

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New information on the Snow Partridge *Lerwa lerwa* (Hodgson 1833) and its systematic position

by R. L. Potapov

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The Snow Partridge *Lerwa lerwa* is one of the most poorly known species of the subfamily *Perdicinae*, if not the whole family *Phasianidae*. Since its description for science in 1833 there have been only three publications on the species, two of which were short taxonomic notes proposing new subspecies. The only publication on its ecology appeared as recently as 1992 (Li & Lu 1992). The only other information is limited to notes on distribution and habitat collected during general avifaunal surveys. There are a few references contained in regional bird faunas (Ali 1962, Ali & Ripley 1969, Vaurie 1972, Roberts 1991) and the most comprehensive information on the distribution and the natural history of the Snow Partridge to date is Baker (1935). The information and even complete sentences from this publication have been repeated in all subsequent accounts of the species.

Whilst its remote distribution may account for the scarcity of information on ecology and complete lack of behavioural data, it is rather surprising that there has been no museum study to investigate its systematic relationships more clearly. This monotypic genus has always been listed with three or four genera of Palearctic mountain partridges (*Ammoperdix*, *Alectoris*, *Tetraogallus* and *Tetraophasis*) at the start of all taxonomic lists of the subfamily *Perdicinae*, despite the absence of any

important similarities with them (Ogilvie-Grant 1893, Peters 1934). This classification was probably based on each author's intuition rather than any systematic analysis and provides no supporting data for this taxonomic sequence.

Here, I use data from museum specimens and the literature to make proposals about the evolutionary history of the species and thus to assess the validity of the traditional taxonomic grouping. In turn I considered habitats and geographical distribution, plumage colouration, wing shape and moult, and adaptations to the cold.

Geographic distribution and habitats

Examination of literature and museum collections provides the following north-western confirmed localities of the distribution of Snow Partridge: Safed-Koh mountains on the Afghanistan-Pakistan border; Nanga Parbat surroundings and sources of the Hunza River in eastern Pakistan (Baker 1935, Roberts 1991). This species does not penetrate to the Hindu Kush range or to the Pamirs, where the subalpine and alpine zones are more arid.

The most north-easterly localities are the northern ridges of the Sino Tibetan mountains at the right bank of Upper Huang (Yellow) River. The species does not penetrate to the north because of the more arid climatic conditions. These distributional affinities suggest that the Snow Partridge has a southern origin: the degree of humidity in Central Asia is an important factor limiting distribution of plants and animals. For example, the range of the Himalayan Snowcock *Tetraogallus himalayensis*, a species adapted to an arid climate, is restricted by a sharp increase in humidity in the subalpine and alpine zones east from Nepal (Potapov 1966).

The Snow Partridge's preferred habitats lie in subalpine and partly alpine zones above the treeline. They are slopes covered by grass, moss, rhododendron and other shrubs, lichen-bearing rocks and stone fields with snow patches. There appears to be overlap of habitats with the Tibetan Snowcock *Tetraogallus tibetanus*, the dominant species varying from place to place. Otherwise, Snow Partridges avoid the snowcocks' main habitat—the barren slopes above the treeline with scarce vegetation. The importance of slope exposure for the Snow Partridges is not known and it may be that in southern latitudes differences between southern and northern slope exposure is not so important as in the north. The main climatic feature of the habitats of the Snow Partridge throughout its range is high humidity, with most precipitation in summer and little snow during the winter. Most of the foraging habitats are snow-free, avoiding the need for altitudinal migrations. The only indication in the literature that Snow Partridges descend to lower altitudes during winters is that they are found at about 2,500 m above sea level during severe winters (Baker 1935).

The relationship between Snow Partridges and a humid climate explains the northern boundaries of its range. The subalpine and alpine belts circle the Tibetan Plateau with a break in the north. The humidity there is high enough because of the influence of summer monsoons, but these do not seriously affect the climatic conditions in the area north of the Karakorum in the west and the Sino-Tibetan mountains in the east (Fig. 1).

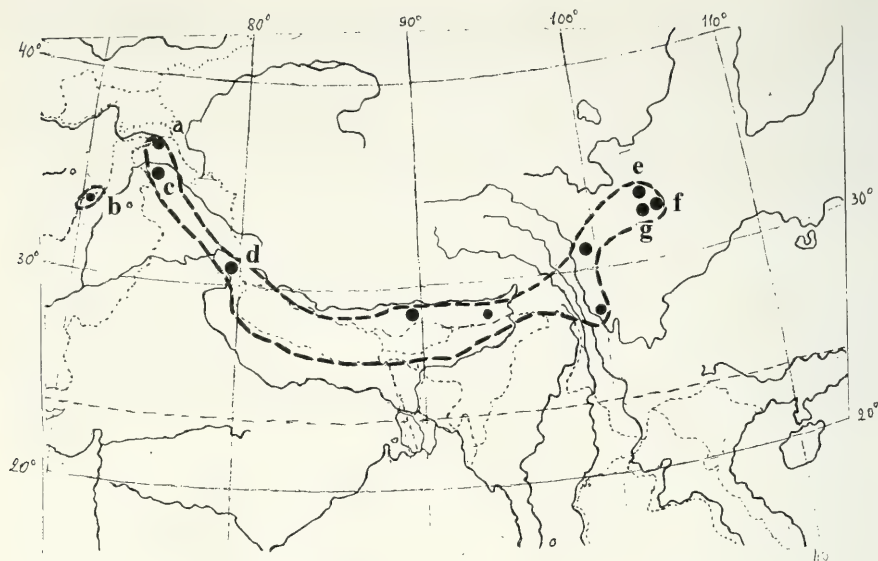


Figure 1. The range of the Snow Partridge, *Lerwa lerwa*. Known limits of distribution in the NW and NE are: (a) Upper Hundjerab Valley (Roberts 1991), 75°E, 37°N; (b) Parachinar (Baker 1934), 70°10'E, 34°05'N; (c) Nanga-Parbat surroundings (Baker, 1934), 74°40'E, 35°N; (d) Garhwal–Baratoli (Baker 1934), 79°E, 31°N; (e) Sigu district (Beresovski & Bianchi 1891), 103°30'E, 3°3'N; (f) Lungan-Fu district, 104°10'E, 32°30'N (coll. Zool. Institute Russian Ac. Sci., St. Petersburg); (g) Longmen Mountains, 103°30'-104°30'E and 31°30'-32°30'N (Li & Lu 1991). Other dots in China's territory—according to Li & Lu 1991.

Plumage colouration

All *Ammoperdix*, *Alectoris* and *Tetraogallus* species have a very pale colouration, especially on the upperparts. This confers a highly cryptic effect in the open, semi-desert habitats that they all prefer. Some populations of snowcock species, however, possess darker upperpart colouration; these inhabit areas with darker substrates and higher humidity. Nevertheless, in all forms there is a complete absence of prominent stripes or spots in the colouration of the upperparts. The *Tetraophaps* species have the dusky grey-brown colouration with the same cryptic effect in the forest habitats that they prefer. In contrast, the upperparts of the Snow Partridge are very dark and are barred by narrow black and white stripes (Plate 2). This colour pattern is unique among the perdicine birds, although there are some species of South and South-east Asian partridges (e.g. Chinese Bamboo Partridge *Bambusicola thoracica*, Chestnut-bellied Partridge *Arborophila javanica*, Formosan Partridge *A. crudigularis*, and Hill Partridge *A. torqueola*) in which the upperparts are barred with black or dark stripes (excluding the head).

The underparts of the Snow Partridge are also very dark brown with white longitudinal stripes formed by white lateral patches on the dark brown feathers. Such



Plate 2. Colour pattern of some *Perdicinae* species: I. Upper view; (a) *Lerwa lerwa* (sexes alike), (b) See-see Partridge *Ammoperdix griseogularis*, male, (c) *A. griseogularis*, female, (d) Chukar, *Alectoris kakelik* (sexes alike), (e) Buff-throated Partridge, *Tetraophasis szechenyi* (sexes alike), (f) Himalayan Snowcock, *Tetraogallus himalayensis* (sexes alike). II. Side view in the same order.

colour patterns are common in some perdicine species and can be seen, for example, in some francolins (*Francolinus squamatus*, *F. nahani* and *F. jacksoni*). The Snow Partridge seems to prefer grassland habitats above the treeline and it tends to avoid large expanses of bare, open land. Its upperpart colouration appears to be a result of cryptic adaptation to the dark background of these habitats, with the striped plumage allowing the bird to blend among the grass stems. Its dark colouration suggests that its previous evolutionary development took place in warm, humid climatic conditions or is a recent adaptation to warm humid conditions and vegetation.

Another important feature of this species is the colouration of downy young. It is completely different from that of the *Ammoperdix*–*Alectoris*–*Tetraogallus* group, but is similar to the colouration of the downy young of the Blood Pheasant *Ithaginis* and, to a lesser degree, with the downy young of the *Arborophila* hill-partridges and the monals *Lophophorus*. In galliform birds, the colouration of the downy young has been used in phylogenetic analyses together with other features, and has been considered to have a useful but not decisive significance (Short 1967, Potapov 1985). The colouration of the young suggests that the Snow Partridge has a closer relationship with the South-east Asian phasianids rather than the *Ammoperdix*–*Alectoris*–*Tetraogallus* group. Snow Partridge show some resemblance in colouration to female Blood Pheasants, both being fully dark-brown with narrow black barring.

Wing shape and moult

The shape of the wing's tip depends on the position of the longest primary in respect to the front edge of the wing. The closer the longest primary is to the front edge of the wing the more pointed the wing is; the more distant the longest primary is from the front edge of the wing, the rounder is the wing. Wing shape of the Snow Partridge is similar to that of the snowcocks *Tetraogallus*, in contrast with the more rounded wing tip of forest partridges (Fig. 2). This trait does not have any phylogenetic significance, as it is more influenced by ecology than evolutionary history. This type of wing shape is an adaptation to high-speed flight with a quick, horizontal take-off, in contrast to the slower flight and vertical take-off of forest partridges and pheasants. The large relative width of Snow Partridge wings (74–75% of wing length instead of 68–70% in snowcocks and rock partridges) indicates a significant capacity for gliding flight. As in snowcocks (Potapov 1992) the downhill gliding flight in high mountains could save a considerable amount of energy to Snow Partridges moving from one slope to another. I hope that further detailed observations will prove this hypothesis.

The moult of Snow Partridges is the same as in other partridges with one principal exception. The three outer juvenile primaries, that appear in chicks during the last stages of growth, are not replaced by adult primaries, like other juvenile primaries, till the following autumn (i.e. in their second year), as in snowcocks. This is most probably an adaptation to specific conditions in high mountains with very short periods suitable for the development of the young bird's wing. Such adaptations could have developed independently in snowcocks and Snow Partridges.

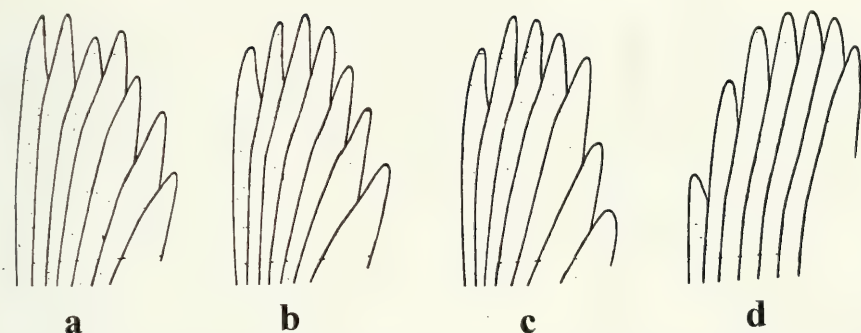


Figure 2. The top of the wing and position of the longest primaries in: (a) Snow Partridge *Lerwa lerwa*, subadult, (b) Snow Partridge *L. lerwa*, adult, (c) Tibetan Snowcock *Tetraogallus tibetanus*, adult, (d) Hill Partridge *Arborophila torqueola*, adult.

Adaptations to the cold

Recent studies confirm that the Snow Partridge lives permanently at high elevations (3,500–5,000 m above sea level) (Li & Lu 1992). Even in summer there are some patches of snow in the main habitats and occasional snowfalls, and July is the only frost-free month. Winter mean air temperature varies between -10 and -25°C with a minimum of about -40°C. There are no data on the quality of winter plumage of the Snow Partridge or on winter body fat reserves. Nevertheless, specimens in collections provide good evidence of adaptation to the cold climate.

First, the Snow Partridge has the most feathered tarsi among all Phasianidae birds (Potapov 1985). On average 42% of tarsus length (up to 55% in some specimens) is feathered. This is more than in some tetraonid species such as the Chinese Grouse *Bonasa sewerzowi*. Even tarsi of recently hatched chicks are feathered (Meinertzhagen 1927). Second, feathers cover the nostrils around the operculum (the ceratinous lid covering the nostrils) as in monals *Lophophorus* sp., but is not atrophied as in tetraonid birds, in which the operculum is completely replaced by feathers (Potapov 1985).

Finally, the body mass of the Snow Partridge also shows adaptation to cold winters. The body mass, which exceeds 700 g at the age of 160–170 days (at the beginning of December) (Li & Lu 1992), is rather high for a bird with such body size (the wing length—185–205 mm). These data were obtained from birds reared in captivity, but it is evidence of the ability of this bird to accumulate fat deposits at the beginning of the winter. In comparison to some tetraonid birds with the same wing length (at the onset of winter) the Snow Partridge is much heavier. The Ruffed Grouse *Bonasa umbellus* has a wing length of about 190 mm and a mean body mass in autumn only of 660 g; the Rock Ptarmigan *Lagopus mutus* from the northern Ural mountains has a wing length of 187 mm and a body mass in autumn of about 500 g. It is well known that tetraonid birds significantly increase their body weight with the onset of winter (Potapov 1985). The Snow Partridge seems to do the same, accumulating fat deposits in the autumn.

Discussion

The colour patterns of adult and downy young birds, distribution, and habitat selection suggest phylogenetic affinities of the Snow Partridge with the partridges of southern Asia, including those of the Himalayas. Inhabiting the marginal habitats along the Himalayan and South Tibetan mountains, the ancestral form of this species penetrated higher into the subalpine zones, where competition with other partridges was markedly less than in forest habitats of the foothills and lowlands. This process of penetration to the open habitats above the treeline reached a special intensity during the Pleistocene cold periods. The Wurmian glaciation (approximately 25,000 years BP) had probably a global influence and led to a marked reduction in forest vegetation, even in the tropics (Hamilton 1976, Shacleton 1977). In the mountains, the treeline descended significantly and the area of the open habitats above this line increased. Of course, similar processes took place in every cold epoch during the Pleistocene. Another important factor in the evolutionary history of the Snow Partridge is the uplift of the Himalayan and adjacent mountain systems. There is evidence that the uplift of the Tibetan Plateau and its surrounding mountain ridges intensified towards the end of Pliocene, but they attained sufficient altitude to develop a subalpine zone only in the early Pleistocene, nearly 1,000,000 years BP (Sinitzin 1962). This is long enough ago to allow the evolution of a new, very sophisticated and specialised species such as the Snow Partridge. In comparison, most species of grouse (Tetraonidae) are significantly younger and the recent species of the snowcocks *Tetraogallus* are probably no older than 50,000–80,000 years (Potapov 1985, 1992). Davison (1982), in his paper on the systematics of the hill partridges *Arborophila*, suggests that there was a series of four invasions southward from continental Asia to the Sunda subregion, between the middle and late Pleistocene. Based on an investigation of intrageneric relationships, Davison concluded that the species from progressively more recent invasions are found at increasingly lower altitudes. The most ancient intruders are Red-breasted Partridge *A. hyperythra*, Red-billed Partridge *A. rubrirostris* and *A. javanica*, which inhabit upper montane forests above 1,500 m in Borneo, Sumatra and Java respectively. Davison did not relate these invasions to periods of Pleistocene glaciation but mentioned that 'in the future it may be possible to correlate these four invasions with the timing of four interpluvial periods, the tropical manifestation of the Pleistocene glaciations'. In any case, the influence of Pleistocene glaciations on tropical regions is not in doubt (Hamilton 1976, Shacleton 1977).

The implications of this influence on the evolutionary history of partridges are considerable. Only events of such global scale might explain the existence of four groups of *Arborophila* in Sunda Islands, as well as the unique systematic and geographical position of the Snow Mountain Quail *Anurophasis monorhonyx* of New Guinea. This is a high altitude species that inhabits the open grasslands of mountain ridge tops at 3,100–4,000 m above sea level. Its ecology is currently unknown. In general, the upperpart colouration of the adult bird is similar to that of the Snow Partridge—sequences of light and black bars. In the Snow Mountain Quail

these stripes are less prominent and, moreover, are divided by a black line along the feather's stem. This similarity may be the result of convergence, in camouflage roles of patterns in grass habitats, and may have evolved in both species independently. The above analysis is far from complete, but it does indicate that the evolutionary history of the Snow Partridge reveals closer affinities to species further south than its current grouping with the palearctic mountain partridges suggests. In order to clarify these relationships, we need new data on the ecology of the Snow Partridge in the central and western parts of its distribution area. The one publication cited above (Li & Lu 1992) is based on investigations of this species' ecology near the north-eastern border of this area. Data are needed for comparative purposes on habitats, daily routine, courtship displays, population dynamics and especially on winter ecology. In addition, information on the coexistence of the Snow Partridge with other galliform birds, especially with *Tetraogallus* species, would further clarify these relationships.

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Re-evaluation of the House Finch subspecies *Carpodacus mexicanus roseipectus* from Oaxaca, Mexico

by Laurence C. Binford

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In his *Catalogue of the birds in the British Museum*, Sharpe (1888) described *Carpodacus roseipectus* based on two adult males from "Oaxaca, W. Mexico (A. Fenochio)" and one adult female from "Oaxaca, Nov. 1860 (A. Sallé)". Ridgway (1901) later reduced *roseipectus* to a subspecies of *Carpodacus mexicanus* (Müller). Moore (1939), in his detailed taxonomic revision, and Miller *et al.* (1957), in the most recent treatment of Mexican subspecies, also accepted *roseipectus*, the latter presumably on the advice of co-author Moore. Neither Ridgway (1901) nor Moore (1939), however, personally examined specimens of true *roseipectus* and, as a result, the subspecies has never been properly characterized.

In the mid 1960s, when T. R. Howell, R. A. Paynter, and A. L. Rand (Paynter 1968) were revising the Carduelinae for "Peters' Checklist", Howell (*in litt.*) asked me if I thought *roseipectus* was a valid race; I thought not, having seen specimens of both presumed *roseipectus* and typical *C. m. mexicanus* from the Oaxaca Valley. Howell (in Paynter 1968) therefore subsumed *roseipectus* in *C. m. mexicanus*.

Later, however, I learned that the specimens of nominate *mexicanus* supposedly from the Oaxaca Valley possessed untrustworthy data and almost certainly came from elsewhere. I therefore suggested (Binford 1989) that *roseipectus* should be re-evaluated and properly characterized in light of this knowledge. In this paper, I do so.

Data on Mario del Toro Avilés specimens

All specimens of *C. m. mexicanus* supposedly from the Oaxaca Valley were collected by Mario del Toro Avilés and labelled "Mitla" (San Pablo Villa de Mitla of Binford 1989), a village 48 km east-southeast of Oaxaca City.

M. del Toro Avilés was a professional collector but was poorly versed in proper labelling techniques. In some cases his localities are clearly erroneous, suggesting

that none can be trusted. A full discussion of this subject may be found in Binford (1989: 60–62). This independent conclusion is supported by Marshall (1964: 353), Crossin and Ely (1973), Dickerman (1974: 9), K. C. Parkes (*pers. comm.*) and A. R. Phillips (*in litt.*).

Specimens of other species labelled “Mitla” by del Toro Avilés have been shown to be from elsewhere. According to the collector himself, his “Mitla” specimens of the Canyon Towhee *Pipilo fuscus* actually came from Tepeaca, a town at 2,257 m in southern Puebla (Marshall 1964: 353); this species is otherwise unknown from the Oaxaca Valley. Further, Dickerman (1974: 9–10) showed that 13 intergrades between the Red-winged Blackbird races *Agelaius phoeniceus gubernator* and *A. p. nelsoni* were probably taken in Puebla. That the questionable House Finch specimens were collected supposedly in 1942 and 1943 (see dates below), the same months and years as the towhees (January 1942 and January 1943) and blackbirds (June 1942), suggests that they also came from Puebla.

One might argue that the dubious Oaxaca Valley House Finches represent migrants from the range of *mexicanus* to the north, but migration is unknown in southern populations of the species, I know of no environmental conditions that would induce migration, and no one else has taken a bird with such a phenotype in the Oaxaca Valley. For further discussion of this subject, see *Provenance of M. del Toro Avilés specimens* below.

I conclude that the del Toro Avilés specimens were not collected in the Oaxaca Valley but probably in Puebla and should be disregarded with respect to the validity of *roseipectus*.

Previous descriptions

The subspecies *roseipectus* has never been properly characterized. In his original diagnosis, Sharp (1888) described each part of the plumage of the adult male but, following the style of the day, failed to specify the characters separating it from true *C. m. mexicanus* (or other forms recognized today) or define his colour terms. Also, his series of “*Carpodacus mexicanus*” might have contained a mixture of subspecies. His only useful characters involved the extent of reddish on the underparts, as follows: “fore neck and breast ashy brown, all washed with pale rose-colour . . .; under tail-coverts whity brown, washed with rosy. . . .” Quite correctly, he considered the female indistinguishable from that of “*C. mexicanus*” [= *C. m. mexicanus*].

Ridgway (1901) treated *roseipectus* as a distinct race of *C. mexicanus* but questioned its validity—for good reason. I have examined the only two specimens (United States National Museum Nos. 143693 and 143694) available to Ridgway, both from Huajuapán de León in northern Oaxaca, and find that the characters attributed to them, and hence to *roseipectus*, are mostly erroneous. Compared to nominate *mexicanus*, their bills are not “decidedly larger” but quite average (exposed culmens 10.5 and 10.7, respectively; see Table 1), and the brown and whitish parts of the plumage are not darker but identical. The red of the head and throat of 143693

is, as noted by Ridgway, darker and more purplish than in most *mexicanus*, but this does not accord with *roseipectus* either; 143694 is scarlet like *mexicanus*. Thus I agree with Moore (1939) that they are in most respects typical *mexicanus*.

Moore (1939) also saw no specimens of *roseipectus*, basing his acceptance of the race on correspondence with J. van Rossem, who in 1938 examined four males (including the type, No. 85, 12, 14, 1146) and two females in the British Museum. Concerning the type, van Rossem noted an "orange-red flush over the whole of the under parts—very faint on abdomen and flanks—strongest on chest. Otherwise, like *mexicanus*, particularly in the sharply defined throat patch." The other males were similar. Judging from van Rossem's description, the British Museum males are extreme examples of *roseipectus* in the extent of reddish.

My analysis of the plumage of adult males more clearly defines the shade and distribution of reddish and brings to light several additional characters.

Diagnosis

Here I describe the characters that separate adult male *roseipectus* from the only contiguous subspecies, *mexicanus*, by comparing Oaxaca Valley *roseipectus* to *C. m. mexicanus* from Morelos and Distrito Federal. Two birds from Hidalgo and most from Puebla (but see *Intergradation*) also fit *mexicanus*. Later I will briefly discuss the allopatric *C. m. griscomi*. Other allopatric races farther north share some of the characters here assigned to *roseipectus*, including extensive reddish on the underparts, but those comparisons must await the thorough taxonomic revision advocated by Hill (1993a). Because House Finch plumage varies considerably through wear and fading, I used only fresh-plumaged skins taken from October to early March. Capitalized colour terms follow Ridgway (1912). I found no plumage differences between six adult females of *roseipectus* and a large series of *mexicanus*.

Upperparts: I found no difference in the colour or pattern of the upperparts. The colour and extent of red on the forehead and superciliaries, unlike the throat region, appear the same. Note that unlike races farther north, this red is sharply defined from the brownish of the crown and face. The darkness of the grey-brown back, obscure back streaks, scapulars, wings, and tail is the same when birds taken at the same time of year are compared. The amount and hue of red on the rump vary so much that I considered detailed comparison impossible; the two races are very similar if not identical.

Throat region: In both races, the red of the chin, throat, and malar region form a patch sharply defined from the face and breast, even though a paler reddish wash extends onto the breast of *roseipectus*. In both races, throat colour varies somewhat, but in series is Scarlet-Red in *roseipectus* and Scarlet (*i.e.*, more orangish) in *mexicanus*. In most specimens of *roseipectus* the colour also tends to be brighter, glossier, and denser. Dietary access to carotinoid pigments is well known to affect the colour but not the extent of reddish/yellowish in males (Michener & Michener 1931; Hill 1993a). When *C. mexicanus* males were fed high-carotenoid and low-

carotenoid diets, they grew bright red and drab yellow throat feathers, respectively, but the extent of carotenoid-pigmented area on the ventral surface did not change with diet (Hill 1993b). Moreover, when a *C. m. griseus* female was paired with a *C. m. frontalis* (Michigan) male, the male offspring had the extent of ventral pigmentation intermediate between the two parental types (Hill 1993b). Thus extent of pigmentation is not dependent on diet. I assume this is the case with *roseipectus* and *mexicanus*, although these races have not been tested. I wonder, however, if diet affects brightness, glossiness and density.

Breast: Of 10 fresh (February-March) specimens of *roseipectus*, nine have a strong wash of Rose Doree variable distances onto the breast, and four as far as the mid abdomen. One has only a weak wash of the same colour on the upper breast. *C. m. mexicanus* normally has no reddish below the throat; according to Ridgway (1901), rarely some slight "bleeding" occurs onto the extreme upper breast, but whether this is within normal variation or the result of intergradation is unknown.

Abdominal ground colour: The ground colour of the abdomen of *roseipectus*, where not washed with Rose Doree, is noticeably paler, more whitish, varying from very Pale Pinkish Buff to Pale Pinkish Buff. The same area in *mexicanus* averages more buffy, varying from Pale Pinkish Buff to Light Pinkish Cinnamon. In a series of fresh specimens, this difference is clearly appreciable. It is less useful in worn birds because the darker colour of *mexicanus* fades. It did not have enough specimens to test whether the races could be separated if specimens were compared date for date. Because the dark abdominal streaks are narrower in *roseipectus*, the pale interspaces are slightly wider, adding to their conspicuousness.

Abdominal streaks: The dark streaks on the abdomen of *roseipectus* are noticeably narrower and slightly sharper-edged (less blurred) than in *mexicanus*. The colour is the same. Next to the extent of reddish, the narrower and sharper streaks, coupled with the paler, more extensive ground colour, is the best way to distinguish *roseipectus*. These characters have not been described previously.

Flanks: I see no difference in the width and colour of the dark flank streaks, which are so diffuse as to make comparison difficult. The ground colour does differ on average. Pale Pinkish Cinnamon in *roseipectus* and Light Pinkish Cinnamon in *mexicanus*. However, the colour is very difficult to assess because of the differing makes of skins, in which the flank feathers range from obvious to obscure. Also, fading probably strongly affects this area. Thus I consider flank colour only a minor character.

Undertail coverts: Continuing the paler trend, the ground colour of the undertail coverts of *roseipectus* varies from a colour between Pale Pinkish Cinnamon and Light Pinkish Cinnamon to Light Pinkish Cinnamon, whereas *mexicanus* averages between Light Pinkish Cinnamon and Pinkish Cinnamon. Possibly, this area may not fade as much as the more exposed flanks, but this is also a character that is difficult to assess. The important characteristic of the undertail coverts is not, however, the

ground colour but the presence of pale reddish. Nine of 18 *roseipectus* (including worn specimens) have at least one feather with a wash of Rose Doree; *C. m. mexicanus* seems never to have any reddish there. Some care is needed to avoid confusing a reddish undertail covert with a displaced rump feather in study skins.

Size (Table 1): Normality and homogeneity among populations from Oaxaca (*roseipectus*), Morelos (*mexicanus*), and Puebla (*mexicanus*) were examined for wing, tail, and culmen lengths. A Bonferroni multiple comparison test was performed when an ANOVA was significant. A contrast test between Oaxaca vs Morelos and Puebla combined was also performed. All statistical analyses were conducted using SYSTAT 5.03 (Wilkinson 1990).

In wing length, *roseipectus* averages significantly smaller than *mexicanus* from Morelos and Puebla (ANOVA: $F=12.8$, $df=2$ and 40 , $P<0.001$, Bonferroni $P<0.01$ for both) and from the last two states combined ($F=46082.4$, $df=1$ and 40 , $P<0.001$). Tail length also is significantly less in *roseipectus* compared to Puebla birds ($F=3.8$, $df=2$ and 38 , $P<0.05$, Bonferroni $P<0.05$) and to the Morelos and Puebla populations combined ($F=14772.5$, $df=1$ and 38 , $P<0.001$) but not to Morelos birds alone. Although culmen length in *roseipectus* measures slightly longer than in all the three groupings of *mexicanus*, the differences are not statistically significant.

Although, surprisingly, wing and tail seem to average longer in Puebla than in Morelos, thus placing a larger bird between two smaller populations, as noted briefly by Moore (1939), the differences between those two states are not, in my samples, statistically significant.

Larger size in *mexicanus* may be correlated with some unknown selective factor in the environment, possibly greater rainfall, as suggested by Moore (1939).

Of the 44 skins of the two races used for measurements, 15 (34.1%) had at least one of the two measurements (wing or tail length) outside the overlap areas and hence were "identifiable" by that alone. However, this assumes that the ranges of my samples represent the maxima for the populations, which is almost certainly not true. In any event, the 34.1% figure does indicate that measurements are useful for only about one-third of the individuals in these populations and therefore are only a weak indication of subspecific identity.

Intergradation

C. m. mexicanus intergrades with *roseipectus* in northern Oaxaca and Puebla. A series ($n=15$) of males in fresh plumage from Huajuapán de León in northern Oaxaca, 2 taken in November and 13 in January, includes some intergrades. Most are like *mexicanus* in having wide abdominal streaks and ventral red restricted to the chin and throat. In respect to the ground colour of the abdomen, however, about half are closest to *mexicanus* and half to *roseipectus*. One specimen (MLZ 49148) has a suffusion of Rose Doree throughout the breast and on the undertail coverts; its streaking and ground colour are within the variation exhibited by Oaxaca Valley *roseipectus*, to which it would be referred if not for its locality. MLZ 49145 has

TABLE 1

Comparisons of wing (chord), tail, and exposed culmen lengths (range, mean in mm; sample size) in adult male *Carpodacus mexicanus roseipectus* and two populations (Morelos and Puebla) of *C. m. mexicanus*. The differences (d) between means for *roseipectus* and other populations are given; those found to be statistically significant are marked with an asterisk (*); see text

	Wing	Tail	Culmen
<i>roseipectus</i>	74.2–79.9 (76.8) n=16	58.2–65.0 (61.9) n=17	9.8–11.8 (11.0) n=17
<i>mexicanus</i> Morelos	75.1–81.4 (78.8) n=16; d=+2.0*	61.0–67.4 (63.0) n=13; d=+1.1	10.0–11.4 (10.6) n=16; d=–0.4
<i>mexicanus</i> Puebla	76.2–83.6 (80.2) n=11; d=+3.4*	59.4–69.6 (64.6) n=11; d=+2.7*	10.0–11.1 (10.7) n=11; d=–0.3
<i>mexicanus</i> Morelos+Puebla	75.1–83.6 (79.4) n=27; d=+2.6*	59.4–69.6 (63.7) n=24; d=+1.8*	10.0–11.4 (10.6) n=27; d=–0.4

sparse, faint Rose Doree edgings down to the lower breast. MLZ 49153 has this colour onto the upper breast. As noted previously, both specimens seen by Ridgway (1901; USNM 143693, 143694) are *mexicanus* in plumage.

One male (MLZ 54738) from 5 km northwest of Tamazulapan [del Progreso], a town 26 km southeast of Huajuapán de León, resembles *mexicanus* in all but the abdominal ground colour, which is intermediate. Another intergrade (MLZ 47073), from 5 km northeast of Huauchinango, Puebla, has pale ground colour, streaks of intermediate width, and a pale Rose Doree wash on the upper breast.

The localities Llano Verde and Rancho de las Rosas are at 2,133 m elevation about 40 km northwest of Oaxaca City and thus between there and Huajuapán de León. Two fresh February skins from Llano Verde (MLZ 47740, 47777) have the pale abdominal ground colour of *roseipectus* but the wide abdominal streaks of *mexicanus*; 47740 also has Rose Doree extending onto the mid breast. A worn male (MLZ 37735, July) from Rancho de las Rosas has intermediate streaks and extensive Rose Doree on the breast and some on the undertail coverts; its pale abdominal ground colour fits *roseipectus* but could be the result of fading.

Thus the zone of intergradation appears to stretch from at least Llano Verde and Rancho de las Rosas northwest through Tamazulapan del Progreso and Huajuapán de León to at least 5 km northeast of Huauchinango, Puebla. That putative *roseipectus* from the Oaxaca Valley vary somewhat in the extent of reddish below the throat, here treated tentatively as an individual variation, might suggest that *mexicanus* genes are encroaching on that region (see also *Distribution*).

Provenance of M. del Toro Avilés specimens

I borrowed from the Moore Laboratory of Zoology 32 adult male specimens of *C. mexicanus* collected by del Toro Avilés purportedly at “Mitla.” These were labelled

as having been taken 7–10 January 1942 (3 birds), 1–15 June 1942 (17), 22 December 1942 (1), and 2–20 January 1943 (11). His dates, however, are probably less trustworthy than his localities (Binford 1989). Of these, only 6 (MLZ 32710, 33416, 33418–33421) are clearly *roseipectus*, all labelled from 1 to 7 June 1942. All have extensive Rose Doree on the breast and pale abdominal ground colour, four have Rose Doree on the undertail coverts, and five have narrow dark abdominal streaks (33416 has wider streaks but probably within the range of variation for *roseipectus*).

The other 26 specimens are closest to nominate *mexicanus*, but some exhibit intergrading characters. Like *mexicanus*, all lack reddish below the throat, and 25 have wide abdominal streaks. However, the abdominal ground colour of the 15 fresh December and January birds (June specimens are too faded for comparison), average buffier than *roseipectus* but slightly more whitish than typical *mexicanus* from Morelos. MLZ 34938 has narrow abdominal streaks like *roseipectus*.

I conclude that among the 32 del Toro Avilés specimens I examined, only 6 are *roseipectus*, presumably from the Oaxaca Valley. The apparent intermediacy of the abdominal ground colour in at least 15 specimens and the narrow abdominal streaks of one bird suggest at least some of the 26 came from the zone of intergradation in Puebla. M. del Toro Avilés never collected in northern Oaxaca.

Synopsis

When M. del Toro Avilés specimens are ignored, only 10 fresh and eight worn birds from the Oaxaca Valley remain. The fresh, and to a lesser extent, the worn specimens, however, are sufficient to reveal that *roseipectus* is a well-marked subspecies restricted to the Oaxaca Valley. Compared with fresh *mexicanus* from outside the region of intergradation, all 10 fresh birds can be identified on the basis of each of the three main characters: reddish extending well onto the breast (to the mid abdomen in four); narrow dark abdominal streaks; and paler and more extensive abdominal ground colour. The first two of these characters serve to identify all worn specimens of *roseipectus*. Reddish in the undertail coverts, when present (nine of the 18 specimens), also denotes *roseipectus*. Average differences in throat, flank, and undertail covert colour and in size may be used to support an identification but are not needed and should not be used to override the primary differences. Compared to *C. m. griscomi* (see below), all *roseipectus* are separable by the presence of reddish on the breast and also by the narrowness of the dark abdominal streaks.

Distribution

In Oaxaca the House Finch is primarily a bird of arid subtropical scrub, which occupies an elevational and climatological belt from 1,400 to 2,400 m between the warmer (frostless) areas of arid tropical scrub below and the colder (heavy frosts) and moister arid pine-oak forest or edaphically drier steppe above (Binford 1989). Oaxaca House Finches range from 900 to 2,440 m and to an unknown extent occasionally enter

regions dominated by arid pine-oak. The extensive arid subtropical scrub of southern Puebla and northwestern Oaxaca, such as around Huahuapan de León and Tamazulapan del Progreso, extends up along tributaries of the Río Balsas.

Between Huajuapán de León and the Oaxaca Valley is what appears to be a formidable barrier to gene flow—an extensive highland mass supporting steppe and both humid and arid pine-oak (Binford 1989, Fig. 1). A possible alternate corridor between the Oaxaca Valley and southern Puebla is afforded by the San Juan Bautista Cuicatlán valley, where *C. m. mexicanus* has been taken at the northern end at Teotitlán del Camino. Between the two valleys, finch habitat is separated by only a narrow stretch of arid pine-oak at about 2,100 m near San Francisco Telixtlahuaca (town at 1,728 m). Although this pathway is restricted by distance, narrowness of the elevational band suitable for arid subtropical scrub in the San Juan Bautista Cuicatlán valley, and the pine-oak barrier mentioned, it would seem the most likely of the two possibilities for gene flow. The available intergrade specimens, however, do not support this hypothesis. These are the two intermediates from Llano Verde and one from Rancho de las Rosas, taken in pine-oak well within the lower southern extent of the highlands separating the Oaxaca Valley from Huajuapán de León. However, the San Juan Bautista Cuicatlán valley has received little ornithological attention, and intergrades may occur there as well. More collecting is needed. Until then, we must assume that the known intergrades indicate at least minor gene flow directly through the highlands.

If global warming continues indefinitely, a significant number of House Finches might eventually breach the highland barrier, with the possible effect of *mexicanus*, with the larger population, swamping *roseipectus*. On the other hand, if any of the phenotypic characters of the Oaxaca Valley population are adaptive, it may retain its uniqueness, or be modified only in part. Moore (1939) correlated smaller size and the paler colour and narrower streaking of the abdomen with arid habitats. The Oaxaca Valley, positioned in a rain shadow caused by the encircling mountains, is drier than much of the range of *mexicanus* (Moore 1939; Binford 1989), so these three characters may indeed be adaptive.

C. m. griscomi

I have given *C. m. griscomi*, an allopatric subspecies seemingly endemic to the Sierra Madre del Sur of Guerrero, only a cursory analysis. It appears to be rather weakly marked but justifiably recognizable because of its allopatry. The adult male (I did not examine females) is similar to *mexicanus* in lacking any reddish below the throat and in having wide dark streaks on the abdomen. It resembles *roseipectus* in its pale abdominal ground colour and pale flanks. Moore (1939) thought the upper parts “much paler gray” and the abdominal streaks wider than in *mexicanus*, but I see no difference in eight male specimens in the Louisiana State University Museum of Natural Science.

Species limits

Moore (1939) and G. E. Hill (*in litt.*) have speculated that *mexicanus*, *roseipectus*, and *griscomi* form a group of populations specifically distinct from House Finches farther north, there being no known intergrades; Hill (1993a) stated that these three races are each other's closest relatives. My study sheds little light on this subject except to demonstrate that intergradation occurs between *roseipectus* and *mexicanus*, and therefore these two subspecies should be treated as belonging to the same group. I seriously doubt that isolating mechanisms exist between the two proposed species and predict that thorough collecting between the two will reveal intergradation.

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Nesting behaviour of the Rufous-headed Woodpecker *Celeus spectabilis*

by Huw Lloyd

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The Rufous-headed Woodpecker *Celeus spectabilis* is a near obligate bamboo specialist whose distribution is restricted to thickets of bamboo, *Guadua weberbaueri*, in southwestern Amazonia (Kratter 1997, Parker 1982, Parker *et al.* 1996) with an isolated record in eastern Brazil (Short 1982). The following description represents the first account of the nesting behaviour of *C. spectabilis*. The nest of this species was first described by Kratter (1998). Like many aspects of its biology, its nesting behaviour, and that of other members of the genus *Celeus*, remain largely unknown (Kratter 1998).

Nest location and habitat

The nest was located in Old Floodplain forest habitat (Phillips 1993) at the Sachavacayoc Centre (12°51'S, 69°21'W), situated on the south bank of the Rio Tambopata, in the Zona Reservada de Tambopata-Candamo, in Madre de Dios, south-east Peru. It was discovered on 15 July 1998 in a live *Cavanillesia* tree *c.* 18 m tall, with a diameter at breast height (DBH) measuring 1.03 m, situated immediately adjacent to the tourist trail at the Centre, *c.* 85 m from the lodge. The nest hole was 1.75 m above the ground. *Cavanillesia* is one of the distinctive genera of Neotropical trees; the trunk is essentially a hollow cylinder, with balsa-like pith and characteristic smooth reddish papery bark, patterned with numerous 'rings' (Gentry 1994). The nest hole faced NW and measured 15.0 cm x 9.3 cm, with the long axis vertically orientated. Measurements of the inside cavity were not obtained in order to minimise disturbance. The vegetation around the nest tree was dominated by *Heliconia* sp., (ground) *Guadua weberbaueri* bamboo (understorey) and two species of palm trees (*Astrocaryum* sp., and *Iriatea deltoidea*).

Nesting behaviour of *Celeus spectabilis*

Limited observations at the nest were made from 15 July until 29 July 1998. Observations were conducted between 0600 h to 1230 h, and in the afternoon between 1400 h and 1745 h. The nest contained one chick, which was not observable until 22 July. On a previous visit to Sachavacayoc Centre between 8 and 25 May 1998 there was no evidence of the nest in the tree, and nest construction and incubation were therefore estimated to have begun in the time between visits to the Centre, on 25 May and 13 July 1998. The age of the chick could not be accurately determined, but it was already well-feathered. It was extremely sensitive to the presence of observers and tourists on the trail, within 15 m from the tree, the chick often responding with

aggressive 'hissing' calls. This occurred even during the night. At this time the hole was half sealed with resin, which had been released from a wound in the tree made around the inner rim of the nest entrance. Neither the adult male nor female was observed roosting with the nestling. During the 6 days following the chick's discovery, it called frequently. Both parents perched on the bamboo stems behind the nest tree often calling. On one occasion the male approached the nest, perching on bamboo stems that were *c.* 5 m from the entrance. On 16 July the female was captured in a mist net placed 5 m from the tree. She was measured, photographed and released at the nest site (bill length=25.6 mm; bill width=11.4 mm; tail length=156 mm; wing length=149 mm; tarsus=29.8 mm).

When the chick was first seen, the nest hole was almost two-thirds sealed with a fresh plug of resin from the entrance rim, caused by the constant pecking of the chick inside the hole. This resin, rubber-like in texture, oxidised after *c.* 8 h. The young bird perched high up in the nest entrance behind the resin. It appeared almost fully feathered, with a rufous head, no red facial markings (identical to the adult female), with the blue eye bordered by a complete blue orbital ring, and an ivory white bill. The male was observed on several occasions perched on the nearby bamboo stems between 1530 h and 1700 h. The female remained within the bamboo thicket behind the tree.

At 1150 h on 23 July both parents were seen flying and calling loudly around the nest tree in response to the presence of a foraging troop of 30 Squirrel Monkeys *Saimiri sciureus* passing through the area. The nest was never seen to be approached by the troop. On 26 July, possibly the same troop of Squirrel Monkeys again passed through the area accompanied by at least 10 Brown Capuchin Monkeys *Cebus apella*. The troop did not seem to notice the nest and their presence elicited no aggressive or defensive behaviour from the parent birds.

Over this period of limited observations neither parent was observed feeding the nestling, and the young bird fed entirely on invertebrates captured from around the nest entrance. These invertebrates were often attracted to the fresh flow of resin. Prey items included dipterans and ants. Dipterans were caught by pecking action, while the ants were caught by the more typical tongue probing. The nestling did not eat coleopterans and caterpillars which had also been attracted to the resin. Both parents were seen to forage over a large area during this period. The male was often seen drumming on live bamboo stems *c.* 300 m from the nest tree and, on another occasion, inspecting the trunk of a strangler fig (*Ficus* sp.) for prey items.

The first observations of the parents feeding the chick were made on the mornings of 27 and 28 July. On each occasion the chick was fed solely by the male. Prior to the male feeding the chick, both parents flew within 10 m of the nest, calling to the chick from perches on live or dead bamboo, or from palm trees, at heights of 2 m to sub-canopy level. Only the male came close to the nest, landing on nearby bamboo stems. He made numerous approaches to feed the young bird who, during this time, had completely extended its head out of the hole. During these approaches the male perched for no longer than 10 s before retreating to a bamboo stem behind the tree.

In response to this, the young bird became increasingly agitated, and it pecked energetically at the hardened resin. On two occasions the nestling attempted to climb out of the nest but appeared unable to push its way past the resin plug. To feed the chick the male first perched on nearby bamboo stems, before flying to the hole and perching on the resin. The young bird stopped calling, allowing the male to regurgitate food items in two bouts over a period of approximately 25 s before flying away. The male repeated this on 3 further occasions, each time perching on bamboo stems before landing on the resin plug to feed the young bird. All the feeding bouts observed occurred within 30 min of each other. Following each feeding bout, the chick disappeared from the nest entrance and ceased calling for *c.* 15 min before re-appearing at the entrance and calling again.

At 0625 h on 29 July the chick left the nest. The resin plug remained in place around the nest entrance. The chick immediately fell to the ground, calling loudly. Both male and female flew to the ground and landed either side of the chick. For the next 30 min both parents enticed the chick from the base of the tree by calling to it, then flying short distances from the chick and perching within 1 m of the ground. The chick followed its parents by hopping along the ground or attempting to fly. Only on two of these attempts did it manage to fly upward and perch less than 1 m from the ground. The birds moved out of view and stopped calling once they were more than 30 m from the nest tree.

Discussion

Although the precise age of the chick and the exact timing of nest construction was unknown, estimations for these parameters fall within the 'probable' breeding season given by Winkler *et al.* (1995). Kratter (1998) also discovered this species nesting in the month of June, at which time, given the nature of visits by the parent birds to the nest, he estimated the birds to be incubating. The nest discovered by Kratter (1998) was located in an 18 m tall dead snag, in bluff-top *Guadua* bamboo habitat at the nearby Tambopata Research Centre (13°08'S, 69°36'W) also situated along the Rio Tambopata. This nest tree, 0.6 m DBH, was partially decomposed, lacked bark and the wood was quite soft (Kratter 1998). However there was no resin plug located at the nest hole entrance. The resin plug in the *Cavanillesia* tree at Sachavacayoc provided a semi-permanent seal to the nest hole whilst also providing the adults with a perch from which to regurgitate food to the chick and preventing at least one of the adults from roosting with the chick. It also attracted numerous invertebrates to the hole upon which the chick fed exclusively for a number of days. The lack of feeding visits made by the parents is undoubtedly due to both parent birds being aware of the presence of the observers, rather than a deliberate feeding adaptation to nesting in this tree species. Kratter (1998) suggests that the amount of suitable nesting habitat is limiting to *C. spectabilis* because it nests in large dead trees which have softwood and a large DBH (>0.5 m). The observations of the *Cavanillesia* nest suggest that *C. spectabilis* also nests in tall, live trees, with a large girth, and that an important factor

in nest site selection for this woodpecker species is the presence of soft wood. This feature is characteristic of the breeding of other members of the genus, e.g. *C. castaneus*, *C. elegans* and *C. loricatus* (french 1973, Oniki & Willis 1982, Short 1982, Slud 1964, Stiles & Skutch 1989, Winkler *et al.* 1995). Such trees are probably more common in floodplain forest habitats with understorey vegetation dominated by *Guadua* bamboo, rather than in pure bluff-top bamboo habitats (pers. obs). *Cavanillesia* species are 'rare' in Tambopata (Phillips, pers. com), only *C. hylogeiton* having been recorded in Madre de Dios and in the neighbouring Departments of Ucayali and Huanuco, while *C. umbellata* has been recorded in other locations around Peru, but not in Madre de Dios (Phillips, pers. com). It is not known whether *Cavanillesia* is more abundant in any one of the 9 forest types currently described for the Tambopata region by Phillips (1993).

C. spectabilis requires large territories within its bamboo habitats (Kratter 1997), and population densities are thus low (Kratter 1995). Population density estimates for this species in south-east Peru range from only 1.85 pairs per km² in bluff-top bamboo habitat, to 2.5 pairs per km² in floodplain forest bamboo and river edge forest bamboo habitat (Kratter 1995). This highlights the need to conserve large areas of floodplain forest bamboo habitat, containing large trees with softwoods such as *Cavanillesia* species, alongside pure bluff-top bamboo habitats to provide suitable nesting areas for this near obligate bamboo specialist. Currently, floodplain forests are the most threatened in the Tambopata region (Phillips *et al.* 1994). Parker *et al.* (1996) considered the conservation status of *C. spectabilis* as 'vulnerable'. Given its low population density, its restriction to *Guadua* bamboo habitats, the extent of these bamboo habitats in southwestern Amazonia (see Kratter 1995), and the paucity of information regarding the *obrieni* subspecies in eastern Brazil (considered as 'threatened' by Parker *et al.* 1996, and known from only one specimen), this woodpecker formally deserves near-threatened status.

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Records of the Black-banded Woodcreeper *Dendrocolaptes picumnus* in Chiapas, Mexico

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González-Ortega & Patricia González Domínguez*

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The distribution of the Black-banded Woodcreeper *Dendrocolaptes picumnus* in Mexico has been considered restricted to the Central Plateau of Chiapas (Alvarez del Toro 1980). Howell & Webb (1995) also reported it on Atlantic Slope, but information about this species in Mexico is limited. Here, we report its occurrence in three physiographic regions of Chiapas: the Northern Highlands, the Eastern Highlands and the Sierra Madre of Chiapas, based on specimens deposited in museums, and on a specimen collected on 1995. These records represent an extension in its known range in Chiapas and provide additional information to that of Howell & Webb (1995). Additionally, the species had not been collected in Mexico since 1963, and no specific information has been published for this species in Mexico since 1957.

The American Ornithologists' Union (AOU, 1998) noted the Black-banded Woodcreeper as resident in the highlands of Middle America from Chiapas south to western Panama and widely distributed in South America. The first published record of Black-banded Woodcreeper (*D. p. puncticollis*) for Mexico was a specimen collected on 22 September 1952 by Raymond A. Paynter Jr., in an area of pines, 8 km E of San Cristóbal de las Casas, Chiapas (16° 44' N, 92° 32' W), at an altitude of 2,400 m (Paynter, 1954). Two years earlier (8 April 1950) two specimens were collected at San José, 44 km ESE of Comitán, Chiapas (16° 05' N, 91° 38' W), at 1,500 m, but these records were not published.

This species was considered very rare by Miller *et al.* (1957) at 9 km SE. San Cristóbal, Chiapas, on 18 April 1954, and 44 km ESE Comitán, Chiapas on 8 April

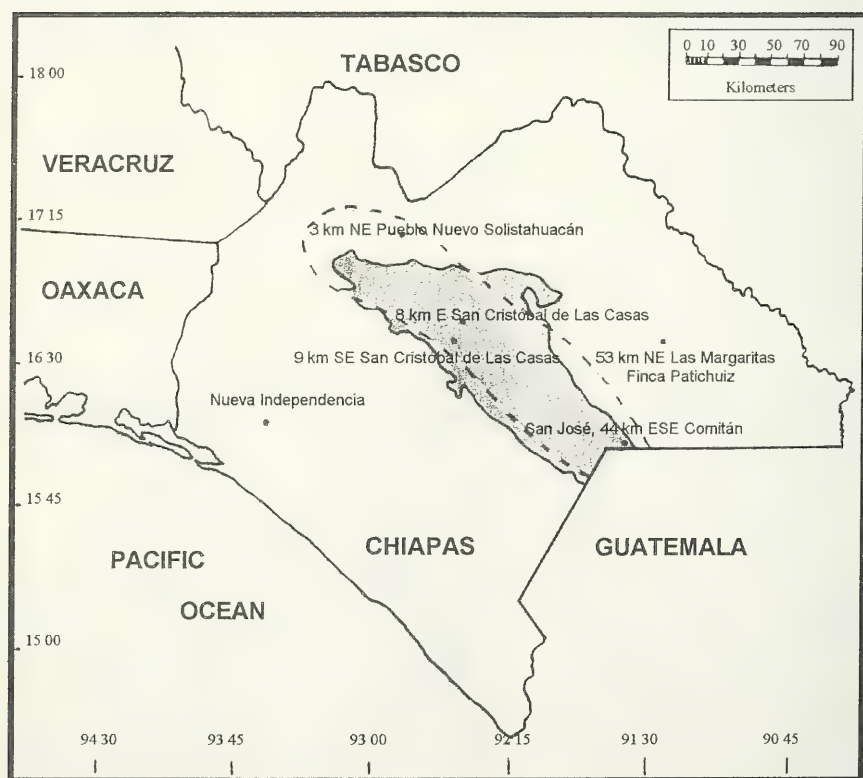


Fig. 1. Collecting sites for the Black-banded Woodcreeper *Dendrocolaptes picumnus* in Mexico with the new range extension to the Sierra Madre de Chiapas. The grey area is the central plateau of Chiapas, the former known range of this species based on Alvarez del Toro (1980). The dashed line represents the approximate range from Howell & Webb (1995).

1950. Alvarez del Toro (1980) cited it as rare in the pine forest of San Cristóbal de las Casas, Teopisca and Comitán in the Central Plateau of Chiapas. Howell & Webb (1995) reported it as uncommon to fairly common resident (1,500-3,000 m locally to 750 m in winter) on the Atlantic-Slope and in the adjacent interior from Chiapas to Honduras.

Specimens from Mexico

While reviewing ornithological information, we found 22 specimens of the Black-banded Woodcreeper in four museums of the United States: Yale Peabody Museum of Natural History, 1 specimen, 8 km E San Cristóbal de Las Casas (16° 44' N, 92° 32' W); Moore Laboratory of Zoology, 1 specimen, 3 km NE Pueblo Nuevo Solistahuacán (17° 11' N, 92° 52' W, c. 2,000 m); Museum of Vertebrate Zoology, 2 specimens from San José, 44 km ESE Comitán (16° 05' N, 91° 38' W), 1 specimen from 9 km SE San Cristóbal de Las Casas (16° 38' N, 92° 35' W, c. 2,000 m); Western Foundation of Vertebrate Zoology, 17 specimens, Finca Patichuiz, 53 km NE Las Margaritas (16° 37' N, 91° 26' W, c. 1,000 m). Another museum did not provide any information concerning 17 specimens collected. These are apparently the only museums worldwide with specimens of this species.

On 12 May 1995, we collected a specimen at Ejido Nueva Independencia, Municipio de Villaflores, Chiapas (16° 12' N, 93° 35' W), in the Biosphere Reserve "La Sepultura", in the Sierra Madre of Chiapas on the Atlantic hillside of Cerro Tres Picos in an open cloud forest. This kind of vegetation includes plant communities classified as Pine-Oak-Liquidambar Forest and Evergreen Cloud Forest (Breedlove 1981), in areas of transition. The main species of plants in this forest are: *Inga* spp., *Clethra* spp., *Pithecellobium* spp., *Ardisia* spp., and *Conastegia* spp. Open cloud forest is that whose canopy is 10 - 40 % coverage (S. A. R. H. 1994).

The specimen is an adult female (measurements in mm): Length, 292; wing-chord, 125.8; tail, 106.5; bill, 29.2; tarsus, 27; ovary 7.3 x 5.5; ovules 1.1, 1.3, 1.6 and 1.7; mass, 47 g; no fat; no moult; skull ossified; culmen grey; mandible grey; mouth grey-white. The specimen was deposited in the ornithological collection of the Instituto de Historia Natural of Chiapas, Mexico (IHN-6087).

Remarks

This record is an extension in its distributional range toward southwestern Chiapas, c. 115 km from its nearest record (9 km SE San Cristóbal de Las Casas) and represents the first specimen collected for 32 years in Mexico. The actual range for this species is thus not restricted to the Central Plateau and is known from four physiographic regions of Chiapas (Fig. 1). Although recorded in a natural protected area, there are many threats because of the agricultural activities of several communities inhabiting the reserve. Recently, the first two authors of this paper visited the area and noticed that it has suffered severe alterations. The first were caused by the cutting of some

areas of forest for the inhabitants of the reserve; the second resulted from forest fires during 1998 in the area; the third was associated with the high rainfall of September 1998, whose destructive effects left several areas of levelled ground; the fourth is the proliferation of coffee crops. The result is an area with fallen trees, without woodland undergrowth and converted into a coffee plantation. The effective conservation of suitable habitat for this bird in La Sepultura and Chiapas is essential to the species' survival. Field surveys are needed to determine the actual situation and an effective education campaign must be undertaken to combat habitat destruction.

Knowledge of the distribution and biology of many species recorded in Mexico has been increasing recently, but field work in many areas is still necessary for a better understanding of our biodiversity, and to support management plans for the reserves. In this task, museums play an important role because of the historical information they hold.

Acknowledgements

We are grateful for the support provided by Comisión Nacional para el Conocimiento y Uso de la Biodiversidad (CONABIO) through the project P060 «Colección Zoológica Regional del Sureste de México. Fase I, Estado de Chiapas» and the project L018 «Avifauna de la Reserva de la Biosfera La Sepultura». We are also grateful to James Northern from Moore Laboratory of Zoology; Carla Cicero from Museum of Vertebrate Zoology; Rene Corado from Western Foundation of Vertebrate Zoology for the information on specimens in these collections, Adolfo G. Navarro Sigüenza and Steve N. G. Howell for their comments on previous versions of this paper.

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Address: Instituto de Historia Natural. A. P. 6. Tuxtla Gutiérrez, Chiapas, México 29000. e-mail jemorape@correo.chiapas.com.mx

MEMBERSHIP

Under the current rules, only Members of the British Ornithologists' Union are eligible to join the Club, and to receive (postage free) four quarterly issues of the *Bulletin*, and the annual index, for an annual subscription of £12 (or U.S. \$26). Applications, enclosing the annual subscription, should be made to the Hon. Secretary (address as below). These Rules are currently being revised to widen Membership to include non-Members of the Union, and details will be promulgated shortly to all Club Members, for approval at a Special General Meeting called for that purpose, later in the year.

The 2000 List of Members is now available free of charge to all requesting a copy, on application to the Hon. Secretary (address below). This list includes E-mail addresses, where known, and Members are requested to inform the Hon. Secretary of all corrections or changes, without delay, for despatch of the *Bulletin*.

To offset the cost of postage, any contribution, or a stamped and addressed envelope (A5), would be gratefully accepted.

UK Data Protection Act. In order to keep records up to date, and to facilitate despatch of the *Bulletin*, names and addresses of Members and Subscribers, and the dates of subscription renewal (but no other personal information), are held on computer disk. If there is any objection to this, please advise the Hon. Secretary, in writing, so that these records can be **deleted from the disk**.

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All amounts quoted are net and should be paid in £ sterling, if possible. Payments in other currencies must include a further £4 for UK bank charges (except for annual rates in US dollars, which are inclusive). All cheques or drafts should be made payable to the British Ornithologists' Club. If preferred, remittances may be made by bank transfer direct to the Club's bank account—Barclays Prime Account, Dale House, Wavertree Boulevard, Liverpool L7 9PQ, UK (Sort Code 20-00-87 Account No. 10211540), with confirmation to the Hon. Treasurer, D. J. Montier, Eyebrook, Oldfield Road, Bickley, Bromley, Kent BR1 2LF.

CORRESPONDENCE

Correspondence on membership, subscription renewers, changes of address and all related matters should be addressed to the Hon. Secretary, Cdr. M. B. Casement OBE, RN, Dene Cottage, West Harting, Petersfield, Hants GU31 5PA, UK (or Email: mbcasement@aol.com). For details of Club Meetings, see inside front cover.

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INSTRUCTIONS FOR AUTHORS

Authors are invited to submit papers on topics relating to the broad themes of taxonomy and distribution of birds. Descriptions of new species of birds are especially welcome and may be accompanied by colour photographs or paintings. On submission, **two copies** of manuscripts, typed on one side of the paper, **double spaced** and with **wide margins**, should be sent to the Editor, Prof. Chris Feare, 2 North View Cottages, Grayswood Common, Haslemere, Surrey GU27 2DN, UK. **Note that electronic versions are not required on first submission.** All contributions should follow the style of papers in this issue, and where appropriate may include half-tone photographs.

When papers are accepted, revisions should be returned to the Editor in the form of both a **hard copy** as outlined above, and also on a 3.5" disk, as **Word or Wordperfect files** for PC.

Authors are entitled to 10 free offprints (16 if 2 or more authors) of the pages in which papers appear. Additional offprints may be ordered when proofs are returned. Authors may be charged for proof corrections for which they are responsible.

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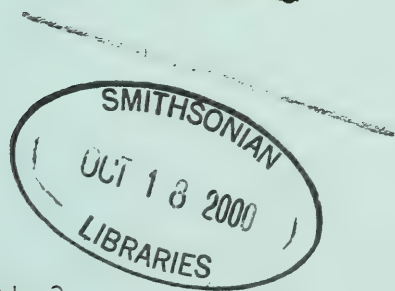
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British Ornithologists' Club



Volume 120 No. 3

September 2000

MEETINGS are held in the **Sherfield Building of Imperial College**, South Kensington, London, SW7. The nearest Tube station is at South Kensington, and car parking facilities are available; a map of the area will be sent to members, on request. The cash bar is open from **6.15 pm**, and a buffet supper, of two courses followed by coffee, is served at **7.00 pm**. (A vegetarian menu can be arranged if ordered at the time of booking). Dinner charges were increased to **£17.00**, as from **3 October**. Informal talks are given on completion, commencing at about 8.00 pm.

FORTHCOMING MEETINGS

31 October - Special General Meeting at 6.30 pm - see details in Club Notes.

Professor R.A. Cheke "*Aspects of Sunbird Biology*". Robert has been watching sunbirds during regular visits to Africa since 1967. In 1976 he began working on a variety of aid projects, principally on onchocerciasis vectors and migrant pests such as locusts and quelea birds, as part of his work for the Natural Resources Institute (NRI). NRI is now part of the University of Greenwich, where Robert is Professor of Tropical Zoology. He is co-author of the B.O.U. Check-list on the *Birds of Togo* and a forthcoming book on sunbirds, flowerpeckers, spiderhunters and sugarbirds. He served on the BOC Committee from 1991-95 and is a former Chairman of the Publications Committee.

Applications to the Hon. Secretary by 17 October please.

28 November - Dr D.E. Pomeroy "*The Uganda Bird Atlas*". After graduating with a degree in Zoology at Cambridge (1957), and a PhD on Animal Ecology in Adelaide (1966), Derek has spent the last 30 years in East Africa, mostly in Uganda where (since 1988) he has been Deputy Director (and Professor) of Makerere University Institute of Environment and Natural Resources (MUIENR) but also 9 years in Kenya (Kenyatta University). His main interests are conservation and biodiversity, especially birds, and he has contributed numerous scientific papers on East African species. Co-author, with Adrian Lewis, of *The Kenya Bird Atlas* (1989), he has for the last ten years been working closely with Dr Margaret Carswell, who has been collecting data since well before that, in the production of "*The Uganda Bird Atlas*".

Applications to the Hon. Secretary by 14 November please.

16 January 2001 - Frank D. Steinheimer "*Undiscovered Cambodia - the endemics of the Cardamom Mountains*." Frank was born in 1971 in Nuremberg, Germany, and studied zoology at Vienna University 1994-98, during which time he made field trips to foreign countries (Europe, Borneo, Thailand, Malaysia). He also gained experience working for the Bird Department of the Vienna Museum, also in Paris Museum. Since September 1998, Frank has been employed in the Bird Group of The Natural History Museum, Tring, working mainly with the wet anatomical and historically important collections (e.g. Darwin). In spring 2000 he took part in an expedition to west Cambodia.

Applications to the Hon. Secretary by 2 January please.

Future Meetings - Advance dates for 2001. Tuesdays:

6 March - Dr T.M. Brooks - *Deforestation and bird extinctions in the Philippines*

1 May - AGM and social evening

3 July - Dr A.F.A. Hawkins - (*Madagascar* - title not yet finalised)

3 April, 25 September, 6 November, and 4 December - speakers not yet finalised.

Overseas Members visiting Britain are especially welcome at these meetings, and the Hon. Secretary would be very pleased to hear from anyone who can offer to talk to the Club, giving as much advance notice as possible - please contact: Michael Casement, Dene Cottage, West Harting, Petersfield, Hants. GU31 5PA. UK. Tel/FAX:01730-825280 (or **Email: mbcasement@aol.com**).

Bulletin of the BRITISH ORNITHOLOGISTS' CLUB

Vol. 120 No. 3Published 17 September 2000

NOTICE OF SPECIAL GENERAL MEETING

to be held at Imperial College, South Kensington, London, SW7
at 6.30 pm on Tuesday 31 October 2000

The only item for the meeting is a Special Resolution to propose the adoption of **new Rules for the Club**, — see full details in leaflet enclosed with this issue.

The proposed new Rules, which have been cleared with the Charity Commissioners, are intended to clarify the Objects of the Club, widen the eligibility for membership, provide security for the Club's assets and make provision for postal voting on any future Rule changes. (**Note:** These changes are being put forward under existing Rule 17, and there is no provision for postal voting.)

For 2001, the current £12 subscription rate will continue as the discounted rate for Members who are also Members of the British Ornithologists' Union, but if the revised Rules are approved (see Rules 2 and 21), a new subscription rate will be introduced as the basic subscription applying to individuals who are not Members of the BOU. Details will be announced with *Bulletin* 120 (4) in early December to become effective on **1 January 2001**.

CLUB NEWS

The 892nd meeting of the Club took place on Tuesday 4 April 2000, at 6.15pm, and was attended by 32 Members and 14 guests..

Members present were: Rev. T.W. GLADWIN (*Chairman*), D.N.S. ALLEN, Captain Sir Thomas BARLOW Bt. DSC, RN, P.J. BELMAN, I.R. BISHOP, Mrs D.M. BRADLEY, Cdr M.B. CASEMENT RN, Professor R.J. CHANDLER, Dr. N.J. COLLAR, Dr. C.T. FISHER, D.J. FISHER, A. GIBBS, D. GRIFFIN, C.A.R. HELM, K. HERON, J.P. HUME, J.A. JOBLING, Dr. C.F. MANN, D.J. MONTIER, Mrs A.M. MOORE, R.G. MORGAN, Mrs M.N. MULLER, P.J. OLIVER, A.J. PITTMAN, Dr R.P. PRÛS-JONES, N.J. REDMAN, P.G.W. SALAMAN, R.E. SCOTT, Dr. R.C. SELF, F.D. STEINHEIMER, N.H.F. STONE, and M.P. WALTERS.

Guests attending were: M.J. BRADLEY, Ms G. BONHAM, Mrs C.R. CASEMENT, Dr J. COOPER, E. FULLER (*Speaker*), Mrs J.M. GLADWIN, Ms B. HAMMOND-GIBBS, Ms K. HOFF, Mrs J.A. JONES, Ms S. LUCK, Mrs M. MONTIER, C.A. MULLER, R. SEITRE, and Mrs S.L. STONE.

On completion, the meeting enjoyed a splendid lecture by Errol Fuller on *The Great Auk*, illustrated by slides of historical documents, and also some of his own paintings. This was based on the research over many years for his most recent major work, *The Great Auk*, published privately, in November 1999. The following is a brief synopsis of his very lively talk.

The last Great Auk died around 150 years ago. The story of the killing of two individuals, often regarded as the last of their kind, is one of the most often-told tales in the whole literature of natural history. The event took place on the Icelandic island of Eldey in June 1844 but although the chilling tale is re-counted in many books, journals and magazines, its original source is rarely cited. We know of it because of two obsessed Englishmen, John Wolley and Alfred Newton, and a spell of bad weather. During 1858 they travelled to Iceland to determine whether or not the Great Auk was truly extinct. Prevented by storms from reaching Eldey, they were marooned for weeks by bad weather at a bleak fishing village and whiled away the time by interrogating the villagers on all matters concerning Great Auks. The results of these interrogations form the single, largely unacknowledged, source for the story.

The most commonly asked question concerning the Great Auk is, 'Why did it become extinct?' There is a common and glib fallacy which, broadly speaking, runs as follows: the species became extinct because museum curators so desired stuffed specimens that they persuaded Icelandic fishermen to hunt down the last few by offering enormous financial inducements. This endlessly repeated allegation is entirely misleading. The species was actually brought to the verge of extinction long before any curator became interested, and although Icelanders undoubtedly killed the last few individuals, they did this for the same reason as their ancestors had done for centuries; they killed them for food. The fact that they sold the skins of the last few birds (for what were, incidentally, trifling sums) after eating the meat, in no way alters their primary motivation.

The reasons for the Great Auk's extinction can be neatly summarised. It was eatable. It was catchable. And there emerged a super-predator that developed the technology to get at it. That super-predator was man and the technology he developed was the boat. Although the process took thousands of years, the Great Auk was doomed from the moment man went down to the sea in boats.

The species is one of the great icons of extinction and there are many examples of its image turning up in surprising places. A brand of cigarettes was once called 'Great Auk' and even a trade union — The Association of Women Clerks and Secretaries, was named after the bird — the AWCS! In addition to the famous story of the killing of the supposed last two, there are other tales that have acquired considerable celebrity — the execution of a bird as a witch on St Kilda (circa 1840) and the capture of a disorientated bird in Waterford Harbour (1834) being among them.

Errol's talk stimulated wide interest, and lively questions. His book is available at £45 (post free), and anyone requiring a copy should contact the author at 65 Springfield Rd., Southborough, Kent, TN4 0RD (tel. 01892 543272) or e-mail: errol@hoppa.demon.co.uk.

The 893rd meeting of the Club was held on Tuesday 2 May 2000, at 6.30pm, following the Annual General Meeting. 21 Members and 6 guests attended.

Members present were: The Rev. T.W. GLADWIN (*Chairman*), Miss H. BAKER, I.R. BISHOP, Cdr M.B. CASEMENT RN, Professor R.J. CHANDLER, F.M. GAUNTLETT, D. GRIFFIN, C.A.R. HELM, J.P. HUME, J.A. JOBLING, R.H. KETTLE, Dr C.F. MANN, D.J. MONTIER, Mrs A.M. MOORE, Mrs M.N. MULLER, M.L. PALING, Dr R.P. PRŶS-JONES, P.G.W. SALAMAN, P.J. SELLAR, F. STEINHEIMER, and N.H.F. STONE.

Guests attending were: Ms G. BONHAM, Mrs M.H. GAUNTLETT, Mrs J.M. GLADWIN, Mrs M. MONTIER, P.J. MOORE, and Mrs S. STONE.

After dinner, the Revd. Tom Gladwin, *Chairman*, gave the following address:

THE BRITISH ORNITHOLOGISTS' CLUB, 1990-1999

This note summarises a review of the Club's development and covers the ten-year period throughout which I have been pleased to serve on the Committee.

Membership

The decade has seen the passing of a number of members who have made significant contributions to the Club, including Dr. G. Beven, who served on the Committee for 10 of his 42 year membership; John Elgood, Chairman (1974-77), who served on the Committee for 13 of his 35 year membership; and Ronald Peal, Chairman (1989-93) and Hon. Secretary (1971-89), who did so much to rejuvenate the Club.

As can be seen from Table 1, there has been a decline of 20% in the number of UK-based members which mostly occurred between 1990 and 1995. In contrast, the decade saw the number of overseas-based members increase by 6%. Overall, membership has fallen by 10% in the ten-year period.

TABLE 1
Membership of the Club, 1990-1999.

YEAR	NUMBER OF PAID-UP MEMBERS			NON-MEMBER SUBSCRIBERS		
	UK	OVERSEAS	TOTAL	UK	OVERSEAS	TOTAL
1990	390	233	623	25	143	168
1991	391	232	623	23	125	148
1992	363	231	594	24	123	147
1993	347	227	574	22	106	128
1994	354	229	583	20	118	138
1995	327	223	550	17	117	134
1996	322	245	567	16	126	142
1997	320	249	569	18	124	142
1998	320	248	568	18	128	146
1999	312	246	558	24	122	146

Meetings and Conferences

Four "special" meetings and a conference held during the decade are particularly worthy of mention. Meeting 804, held during the International Ornithological Congress, at Christchurch, New Zealand, on 5 December 1990, was a "Conversazione" attended by no fewer than 52 members and 45 guests. Two years later, on 19 November 1992, the Club celebrated its centenary with a dinner held in the Stationer's Hall, London. The invited speakers at this memorable event included the Vice-President of The Royal Society, Sir Brian Follett; Professor Janet Kear, President of the British Ornithologists' Union; Dr. Carlo Violani from the University of Pavia; and the Director of the British Trust for Ornithology, Dr. Jeremy Greenwood. Dr. James Monk and Ronald Peal proposed and responded to toasts on behalf of the Club which was further gratified by the many congratulatory greetings received from all parts of the world.

A well attended joint meeting with the Linnean Society on *Avian Taxonomy from Linnaeus to DNA* was held at Burlington House, Piccadilly, on 23 March 1996. The Proceedings of this important meeting were published by the Club in *Bull. BOC.* 117 (2) (June 1997).

In November 1999, the Club partnered the British Ornithologists' Union, Natural History Museum, and BirdLife International in a fully booked and highly successful joint conference at Tring, *Why Museums Matter: Avian Archives in an Age of Extinction*. The Proceedings are to be published in the Club's series of "Occasional Publications".

Visits to places of relevant ornithological interest have also featured in the period under review. The interest in a visit to the Natural History Museum, at Tring on 30 June 1993, was such that it had to be repeated on 22 April 1994, for those who couldn't be accommodated on the first visit. Other visits, which were also fully booked, were to the home of Gilbert White at Selborne (Hants) on 31 May 1996, and the Darwin Museum at Down House (Kent) on 24 June 1999.

As can be seen from Table 2, the average attendances at Dinner Meetings, which are entirely financed by those attending them, have fallen slightly. This is mainly due to members entertaining fewer guests.

TABLE 2
Average attendances at dinner meetings 1990-1999

YEAR	NUMBER OF MEETINGS	AVERAGE ATTENDANCES		
		MEMBERS	GUESTS	TOTAL
1990	11	28	19	47
1991	9	30	18	48
1992	9	28	15	43
1993	10	25	13	38
1994	10	27	15	42
1995	8	30	12	42
1996	9	24	11	35
1997	8	27	10	37
1998	8	28	12	40
1999	8	25	12	37

Publications

The income from the invested proceeds from the sale of "Clovelly", the Club's freehold property at Tring, and the generous initiative by Dr. James Monk in establishing a Publications Fund, have facilitated a policy to publish certain ornithological works of scientific importance, some of which may not necessarily be commercially attractive. Including the June 1997 issue of the *Bulletin* (117: 83-150), which was devoted to the Proceeding of the joint meeting with the Linnean Society *Avian Taxonomy from Linnaeus to DNA*, seven special publications appeared during the decade under review.

In 1992 the Club marked its centenary with a special issue of *Bulletin* (Volume 112A), *Avian Systematics and Taxonomy*. Comprising papers contributed by 26 experts in that field, edited by Dr. James Monk, and supported by excellent reviews, it has become widely recognised as a major work. The second production, *Birds, Discovery and Conservation* (1992), was published by Helm Information having been largely funded by the Club. Edited by Dr. David Snow, this is a fascinating ornithological anthology sub-titled "100 years of the *Bulletin* of the British Ornithologists' Club".

Encouraged by the results of its entry into the publishing field, the Club decided that, where appropriate, future books would form an "Occasional Publications" series. The four publications in the series to have appeared to date are *Extinct and Endangered Birds in the Collections of the Natural History Museum* (Knox & Walters 1995), *Manuscripts and Drawings in the Ornithological and Rothschild Libraries of the Natural History Museum at Tring* (Warr 1996), *Avian Eggshells: an Atlas of Scanning Electron Micrographs* (Mikhailov 1997), and the long awaited *Type Specimens of Bird Skins in the University Museum of Zoology Cambridge, United Kingdom* (Benson 1999).

The *Bulletin* continues to be a widely valued and very readable publication. Volumes 110 (1990) to 119 (1999) varied in length from 232 to 320 pages. The increasing inclusion of colour plates, from one in 1994 to six and five in 1998 and 1999 respectively, has added to its appeal. The number of important papers offered to the *Bulletin* continues to increase, and far exceed the space available.

Finances

Having won its appeal against Dacorum Borough Council's refusal to allow the residential redevelopment of "Clovelly", the Club sold the property and thus liquidated an asset with a poor return. The income from the invested proceeds have significantly strengthened the Club and, as evident from the foregoing and along with other beneficial developments, have enabled it to expand its publishing and other activities.

Table 3 summarises the Club's financial performance through the period under review. Until 1993 the Club's accounts were produced on a net basis. The figures for the years 1990 to 1993 have therefore been recalculated to be entirely comparable with those for subsequent years. As can be seen, the Club's

income has increased by some 70% during the decade, and income has mostly exceeded expenditure. Publication sales have been good and, overall, have not required a permanent draw on capital.

The Club's investment policy has the objective of providing the income necessary for its various ventures, whilst securing capital growth sufficient to maintain the purchasing power of its funds. To date, thanks to the advice of its trustees, this has been achieved. Over the past decade, as can also be seen from Table 3, the Club's assets, which now total £300,000, have grown at 9% compound per annum.

TABLE 3
Financial summary, 1990-1999

YEAR ENDING 31ST DEC	GROSS INCOME	GROSS EXPENDITURE	EXCESS/(DEFICIT) OF INCOME OVER EXPENDITURE	NET ASSETS
	£.	£.	£	£'000s
1990	19,378	20,098	(720)	125
1991	17,345	16,410	935	192
1992	32,538	36,249	(3,711)	175
1993	23,769	20,390	3,379	178
1994	25,827	24,369	1,458	179
1995	25,631	20,082	5,549	207
1996	31,344	22,251	9,093	225
1997	33,698	30,729	2,969	258
1998	33,118	23,459	9,659	281
1999	33,461	30,130	3,331	300

Conclusions

Although attendances at dinner meetings have fallen slightly and membership, now stable, fell by 12% between 1990 and 1995, the Club is in a strong and healthy condition.

The Club has expanded its activities to include visits to places of ornithological interest, and the production of "Occasional" publications. Improvements to the *Bulletin*, to secure the benefits of technological advances, are also in hand.

The inter-dependent publications and investment policies continue to be achieved, income generally continues to exceed expenditure, and assets to grow at a rate in excess of inflation.

With its special interests in avian systematics, taxonomy and distribution, the Club continues to occupy an important and distinctive niche in ornithology which it is well positioned to continue serving into the new millennium.

Following the Chairman's address, a series of short talks was given by Members on subjects of topical interest; the following is a brief synopsis.

"The study and conservation of the Yellow-eared Parrot *Ognorhynchus icterotis*" by P.W. Salaman. In the early 1900's, this species was abundant across the High Andes of Colombia and northern Ecuador. However, by the mid-1990's, it was reduced to only two surviving flocks, one in Ecuador, another in Colombia, together numbering less than 50 individuals. Sadly, the last sighting in Ecuador was of a pair in September 1998.

Little was known about the natural history of the Yellow-eared Parrot, an unique monotypic genus, except that it was considered highly nomadic, moving large distances across the Andes in search of seasonal fruiting blooms, and nested in Wax Palms *Ceroxylon quindiuense*, the world's tallest palm standing over 65 m high, and Colombia's national tree.

Proyecto Ognorhynchus is supported by Loro Parque Foundation and American Bird Conservancy. After a year of searching in Colombia, we finally found a roost-site with three flocks totalling 81 birds in April 1999. The project immediately commenced intensive monitoring by two fieldworkers at this new location — a wealth of information on the parrot's ecology and natural history was gathered, enhanced by the discovery of an active nest and the mounting of three radio-transmitters.

The Yellow-eared Parrot has a varied diet although feeds extensively on Wax Palm (76% of observations), particularly on the unripe palm fruits around the roost locations. This dependence on the Wax Palm is emphasised by the study results. Few bird species have such a complete dependency, on a single species of plant, as has the Yellow-eared Parrot on the Wax Palm for breeding, roosting and feeding. This gives great concern as this is now restricted to only a few small pockets in the Cordillera Central of Colombia. Juvenile palm recruitment in the past 50 years has been non-existent as cattle graze on seedling palms, whilst adult palm mortality is accelerating for unknown reasons.

The long-term survival of the species is precariously in the balance because the Wax Palm itself is critically endangered. We are presently mounting a long-term study of the Wax Palm and implementing a tree nursery for future reforestation with palms and other key feeding species.

“Some notes on the avifauna of the Cardamom Mountains, SW Cambodia” by Frank D. Steinheimer. As part of an international expedition, organized by Fauna & Flora International in conjunction with BirdLife International, Jonathan Eames (BirdLife) and I undertook an ornithological survey of the Cardamom Mountains, including selective collecting of bird specimens. The summits of the Cardamom Mts (up to 1,813 m) are much lower than those of other mountain regions of SE-Asia, with only the highest showing limited upper mountain scrub vegetation. As a result, only a few endemic bird taxa have evolved in the Cardamoms, as J. Delacour had already noted in his *Ibis* paper of 1929. The low species numbers, however, are compensated by a very interesting and largely unstudied avifauna. Two particularly interesting constituents of this are the Chestnut-headed Partridge *Arborophila cambodiana* and the Cambodian Laughingthrush *Garrulax ferrarius*, of which specimens were shown at the meeting. Altogether 52 skins, 63 wet anatomical specimens and 35 tissue samples were collected, including more than a dozen new records for Cambodia, unique spirit material and several new skin taxa for the Tring collection. A detailed publication is in preparation.

“How and when did Australia gets its Bustard?” Martin Gauntlett posed this question because Australia shares several bird species with other parts of the world — birds of prey such as Barn Owl, Peregrine, Osprey and Black Kite, and water birds such as Great Cormorant, Great Egret and Common Coot. But the Australian Bustard is unusual because, although sufficiently similar to the Kori Bustard to have been considered the same species, it is separated from its nearest relatives in India and Africa by some 7,200 km.

The Kori Bustard weighs up to 19 kg and is not aerodynamically built for long-distance flights, so direct flight seems unlikely. Only one species of bustard, the Houbara Bustard, is truly migratory, but this does not cross any major body of water. Reports that the Australian Bustard may cross the 140 km Torres Strait requires confirmation.

India, Africa and Australia were once all part of Gondwanaland, until separated by continental drift, so could the bustard be Gondwana relics from 150 million years ago? A popular theory for the origin of the ratites is that they arose from a Gondwana ancestor and evolved into Rheas, Ostriches, Emus and Moas etc. But it seems unlikely that, whereas these have evolved into very distinct species, the bustards could have remained almost unchanged over this timeframe.

Homo erectus arrived in what is now Java probably between about half to one million years ago, so also may have bustards. Sea levels during glacial times were much lower, the Greater Sunda islands were joined to the mainland of SE Asia and the colder and drier climate might then have favoured suitable habitat for bustards, with more savannah and less forest. From there, with reduced sea levels, it was a very short crossing of the Lombok Strait to the Lesser Sunda Islands, then joined as a single island, and a final crossing of less than 160 km to the extended coastline of Australia. The whole area is geographically unstable and prone to violent eruptions and Mr Gauntlett speculated that maybe a volcanic event hastened their departure towards Australia.

He concluded that Africa was the centre of bustard evolution, and that the ancestral Kori Bustard population expanded, evolving into the Arabian and Indian Bustards, continuing through SE Asia, which was more savannah than now, eventually arriving in Australia. Intervening populations of bustards died out when post-glacial forests replaced the savannah. In support of this theory, both the Black-necked Stork and Sarus Crane have populations in both India and Australia, the latter with a relict population in SE Asia.

The speaker would like to hear of any other theories, or genetic evidence, to explain this mystery.

“*Microhierax* on the Nicobars?” by Robert Prýs-Jones. Evidence for the presence of the falconet *Microhierax* sp. on the Nicobar Islands rests entirely on two specimens supposedly taken there in the 19th Century, one of which was subsequently destroyed. Any effort to re-assess the acceptability of these records is made more difficult through problems such as the passage of the specimens through the hands of a dealer and a clear case of label switching. On presently available evidence the records are unacceptable, but the case is presented to illustrate the multiple uncertainties that on occasion can surround museum specimen material.

The Journal “*The Gelderland*” by Julian Hume. During the late 16th Century, small companies based in the Netherlands funded small fleets to trade in northern Europe, Africa, and S.E Asia. To make these companies more competitive against the Portuguese, they were united to form the Dutch East India Company. Each fleet was instructed to keep a journal of the voyage and, in particular, note any discoveries that might be useful to the company. Not only did this include trade, but also ports of call for refreshment.

In 1601, a fleet led by Admiral Wolphert Harmensz in the flagship *The Gelderland*, anchored off Mauritius from 27 September–20 October. During this stay, an unknown artist drew endemic birds captured and killed on Mauritian soil. These sketches were included in the two-volume *Gelderland* journal, now kept at the General State Archives in the Hague, with the first volume giving an account of the voyage, whilst the second just contains pictures. The bird sketches are pencil and ink drawings of Van den Broecke’s Red Rail *Aphanapteryx bonasia*, the Dutch Pigeon *Alectroenas nitidissima*, the Broad-billed Parrot *Lophopsittacus mauritianus* and five illustrations of Dodos *Raphus cucullatus*. These drawings constitute, without any doubt, the only depictions of these now extinct Mauritian birds drawn from life, and provide important morphological details that would otherwise never have been known. The text that accompanies the Dodo sketches describes the birds’ unfortunate culinary usefulness and what became one of the determining factors in the species extinction: “these birds can be caught on the island of Mauritius in vast quantities, for they cannot fly and provide good food and refreshment”.

Unusual nest entry of the Yellow-rumped Cacique *Cacicus cela*? Michael Casement produced a specimen of a nest obtained on a recent visit to Trinidad. It had been found, dislodged by high winds, on the ground below a nesting colony in a village near Arima, and was typical, as described in the literature — constructed of fibres and vines, about 45 cm long, and bag-shaped, with a hole near the top.

But what had interested him was the spectacular method of entry by the parent birds into nests on the colony. On at least three occasions he saw birds swoop directly into the hole, apparently without pausing at the nest edge, and disappear inside. A local Trinidadian guide had commented that this method of entry was a feature of the Yellow-rumped Cacique, but no mention of this remarkable manoeuvre appears in the guidebooks. He asked the audience if this behaviour had been previously observed for this species, or for the rather similar Crested Oropendola *Psaracolius decumanus*.

In subsequent correspondence, Bill Murphy, author of *A Birder’s Guide to Trinidad & Tobago* (1986) replied: “The only time I’ve seen this sort of dive-bombing behaviour was with Belted Kingfishers, which fly full speed into their nest holes. I suppose pneumatic pressure is all that stops them”. Richard French had “not seen Caciques entering nests in quite the way described ... though females don’t hang around for long when they return. The usual method in my experience is to fly up to the nest, pause very briefly — perhaps only for half a second — at the entrance, then dive in. ... The only thing similar in my experience is the arrival at the nests of Lesser Swallow-tailed Swifts, which just seem to zoom in to

their similarly shaped nests without stopping. But then one might expect something like that from a swift!"

Michael Casement gladly accepts Richard French's explanation — it was probably an optical illusion, but the pause was exceptionally brief. He would be pleased to hear from anyone else who can add further comments on this observation.

ANNUAL GENERAL MEETING

The Annual General Meeting of the British Ornithologists' Club was held in the Sherfield Building, Imperial College, London SW7 on Tuesday 2 May 2000 at 6 p.m. with The Reverend T.W. Gladwin in the Chair. Apologies had been received from Captain Sir Thomas Barlow Bt., D.R. Calder, Dr. N.J. Collar, S.J. Farnsworth, D.J. Fisher, G.E. Green, N.J. Redman, and R.E. Scott. 19 Members were present.

The Minutes of the Annual General Meeting held on 4 May 1999, which had been published (*Bull. Brit. Orn. Cl.* 119: 138-140), were approved and signed by the Chairman.

Chairman's report

The transactions of the Club during 1999 were essentially summarised in the report of the Committee. Nonetheless certain events and matters being currently progressed or considered merited further attention.

The pattern of occasional visits was continued with a well attended visit in June to the home of Charles Darwin, at Down House in Kent. Another highly successful event was the conference, held jointly in November with the British Ornithologists' Union, the Natural History Museum and BirdLife International, "Why Museums Matter: Avian Archives in an Age of Extinction!". The Club will be publishing Proceedings arising from the Conference and Workshop in its *Occasional Publications* series. On the subject of publications, *Type Specimens and Bird Skins in the University Museum of Zoology, Cambridge, United Kingdom* by C.W. Benson (1999) was printed and ready for publication by the year end. The eventual appearance of this important work would have particularly delighted Ronald Peal, our late Chairman, Hon. Secretary, and great servant to the Club. Julian Hume's fine colour plates of the extinct Newton's Parakeet *Psittacula exsul* are appropriately dedicated to his memory. Ronald Peal's obituary appeared in *Bulletin* 120: 5-7.

Other forthcoming publications will include the *Bird Atlas of Uganda*.

Advised by the Editor and others, the Committee decided on a number of alterations to the *Bulletin*. Changes in the production processes, the transfer of printing from Henry Ling Ltd. to Crowes Complete Print of Norwich, and a slight change to the standard size, are expected to save up to £1,000 per issue. Other changes include a less congested crisper print format, and the use of a better quality paper providing for high quality colour reproductions.

The Committee continues to progress drafting a new set of Club Rules which will be commended to the membership in due course. If approved, the new Rules will open up the membership to non-BOU Members, whilst materially recognising the warm and historic links which we continue to enjoy with that organisation. The proposed changes will also seek to be more specific in defining the Club's special interest in avian systematics, taxonomy and distribution; update the Rules concerned with the security of its assets; and enable wider membership, i.e. those not able to attend meetings, to vote on future Rule changes.

He recorded his thanks to Michael Casement (*Hon. Secretary*), David Montier (*Hon. Treasurer*) Robert Prŷs-Jones (*Chairman* of the Publications Sub-Committee) who was a principal organiser of the joint conference held in November, all other Members of the Committee, Members of the Publications Sub-Committee, including Amberley Moore and James Jobling who assisted in securing the publication of Benson (1999), Professor Chris Feare (*Hon. Editor of the Bulletin*), Mary Muller for producing the index to the *Bulletin*, John Farnsworth (*Hon. Publications Officer*), Francis Stone (*Hon. Archivist*), the Trustees of the Herbert Stevens Trust Fund, Imperial College for the provision of the facilities for the Dinner Meetings, and all who have contributed to the Club in many ways during the past year.

The Annual Report of the Committee for 1999

The *Hon. Secretary* pointed out that this was now an integral part of the Annual Accounts, copies of which were before all Members present, and would be published in the June issue of the *Bulletin* 120 (2). He drew attention to some of the highlights of this report, and called for any questions. There were none.

The Annual Accounts for 1999

The *Hon. Treasurer* presented the accounts for the year ended 31 December 1999, and drew attention to the salient features. Total income at £33,461 was very similar to the previous year, but expenses of £30,130 were higher, mainly due to the publication costs of *Occ. Pub.* 4, which was completed right at the end of the year. The net result for 1999 was an excess of income over expenditure of £3,331, which, coupled with an increase of £14,736 in the market value of investments, took the net assets of the Club to just under £300,000. The adoption of the Accounts was proposed by Mr Montier, seconded by Mrs Moore, and approved by all present.

The Bulletin

Professor Chris Feare (*Hon Editor*) said that the changeover to the new printers had gone smoothly, although there had been a few teething problems. The new procedures were leading to substantial cost savings and the new format seemed to have been generally well received. He reported that whereas 44 papers had been received in 1999, the number received in the first four months of 2000 already totalled 26. This influx, together with a need for major editorial input on some of them, was imposing an unexpectedly large burden. He highlighted the valuable and often time-consuming contribution of reviewers to the quality of the *Bulletin*, and thanked Mary Muller for preparing the index to Volume 119, with which there had been difficulties this year as a result of the changeover of printing procedures. This was due to appear with Volume 120 (2). He also thanked Michael Casement for preparing the Club Notes and cover information, and Effie Warr for her assistance in many fields.

Election of Officers and Committee

The Chairman said that the Committee's proposals had been published in *Bull. B.O.C.* 120(1):2. There being no other nominations to the offices of Honorary Secretary and Honorary Treasurer, and no Committee Members due to retire, the Committee remains unchanged for the next year. Commander M. B. Casement was re-elected Honorary Secretary and D. J. Montier was re-elected as Honorary Treasurer.

No other items for discussion had been notified in accordance with Rule (12), and the meeting closed at 6.35 p.m.

BOOK RECEIVED

Mees, G.F. 2000. *Birds of the Rupununi South Savannah, Guyana*. Pp 50, 11 colour plates. Privately published. Copies available for A\$ 50 from the author at 31 West Street, Busselton 6280, Western Australia.

This study, based on two visits from August to December and from January to March respectively, was aimed at investigating the degree to which the avifauna of Rupununi resembled that of the previously studied Sipaliwini Savannah in Suriname. Considerable differences were documented, partly explicable as a result of the lack of rain forest at Rupununi, and the author concludes that in some respects the Rupununi avifauna more closely resembles that of the Suriname coastal lowlands.

Robert Prÿs-Jones

Six overlooked specimens of Bruijn's Brush-turkey *Aepypodius bruijnii* (Oustalet, 1880)

by Claire Voisin, Jean-François Voisin,
Soekarja Somadikarta, & René W.R. J. Dekker

Received 24 January 2000

Bruijn's Brush-turkey *Aepypodius bruijnii* (Oustalet 1880) is a virtually unknown megapode living on the island of Waigeu, Irian Jaya, Indonesia. Only 15 specimens of it have been recorded so far. Six are in the collection of the American Museum of Natural History, New York, and two, including the type, in the collection of the Muséum national d'Histoire naturelle, Paris; and one each in the Nationaal Natuurhistorisch Museum, Leiden, The Natural History Museum, Tring, the Staatliches Museum für Tierkunde, Dresden, the Turati Collection, Milano, the Academy of Natural Sciences, Philadelphia, the Senckenberg Museum, Frankfurt and the Zoological Museum of the University of Hamburg (Jones *et al.* 1995).

Examination of the collections of the Muséum national d'Histoire naturelle recently revealed that this institution possesses not two but eight specimens of Bruijn's Brush-turkey, so that the world's known total is in fact not 15 but 21. A list of the eight specimens in Paris is given here :

- (1) C.G. 1880-1551. Holotype of the taxon. Flat skin, previously mounted specimen. Inscriptions under the pedestal : Talegallus (*Aepypodius*) Bruijnii / (Type) (Oust.) / M. Bruijn Waigiou.
- (2) C.G. 1880-1553. Flat skin. This is the juvenile described by Oustalet in 1881 a & b. First label : Talegallus / *Aepypodius* Bruijnii / jeune (Oust.) / Waigiou / L. Laglaize Ne Guinée. Second label : A.A. BRUIJN TERNATE [printed] / N. Guinée Waigeo 1879 /// N° 18.
- (3) C.G. 1886-12. Mounted specimen. Île Waigiou / acq. à M. Laglaize / Talegallus Bruijnii / (*Aepypodius*.) (Oust.)
- (4) C.G. 1887-416. Mounted specimen. Talegallus (*Aepypodius*) Bruijnii (Oust.) / M. Laglaize Nlle Guinée Waigiou ♂ / (JT). (see Plate 1)
- (5) C.G. 1887-417. Mounted specimen. Talegallus (*Aepypodius*) Bruijnii (Oust.) / ♀ Mr Laglaize (Waigeou) Nlle Guinée / JT.
- (6) C.G. 1999-3023. Flat skin. Label : *Aepypodius* bruijni / Col. Bruijn Waigiou /// B [large, in red] 65.
- (7) C.G. 1999-3024. Flat skin. First label : *Aepypodius* bruijni / Col. Bruijn Waigiou /// B [large, in red]. Second label : G Waigeo E [struck off] /// A.A. BRUIJN TERNATE [same label as the second one of no. 1880-1553].

Plate 1. Bruijn's Brush Turkey *Aepyodius bruijnii* (Oustalet, 1880): male specimen from Waigau in the collections of the Muséum national d'Histoire naturelle, Paris. This species has not yet been seen alive by western scientists. Photograph copyright P. Lafitte / Muséum national d'Histoire naturelle.



- (8) C.G. 1999-3025. Flat skin. Label : *Aepypodius bruijni* / Col. Bruijn Waigiou /// B [large, in red] 64.

C.G. stands for « Catalogue général », now the only catalogue in use in the Laboratoire des Mammifères et Oiseaux of the Muséum national d'Histoire naturelle. The meaning of the initials « JT » is lost, they are probably some kind of signature. The symbol / is used for a change of line, and /// means that the text goes over on the other side of the label. Specimens with a large, red « B » on their labels come from the collection of Adolphe Boucard (1839-1905), a French natural history dealer who settled in London towards the end of the 19th century and left a large part of his collection to the M.N.H.N. Léon Laglaize was a French travelling merchant who traded specimens with A.A. Bruijn.

Meyer de Schauensee (1940) was the first to give an overview of the number and whereabouts of specimens of *Aepypodius bruijnii*, a species which up to now has never been seen alive by western scientists. He listed 12 specimens, all except a single skin collected by hunters of A.A. Bruijn around 1880. Confirmation that the species really originated from Waigeu, which was doubted for many years (see e.g. Peters 1934), came in 1939 when one specimen was taken by a local collector for the Denison-Crockett Expedition of the Academy of Natural Sciences in Philadelphia. The six specimens now discovered were received after Oustalet's publications (1880, 1881 a & 1881 b), but were all collected before 1905 by Bruijn's hunters.

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Rediscovery of *Asthenes wyatti azuay* (Chapman 1923) with notes on its plumage variation and taxonomy of the *Asthenes anthoides* superspecies

by N. Krabbe

Received 20 March 1999

The type of *Asthenes wyatti azuay*, the southern Ecuadorian form of the Streak-backed Castanero, remained unique for 75 years until 1992, when I secured seven specimens and compared these directly with the type specimen in the American Museum of Natural History (AMNH). Chapman (1923) considered the almost entirely rufous wings of *azuay* as evidence that its closest relatives to the north and south, *A. w. aequatorialis* and *A. w. graminicola*, did not intergrade but the variation in the new series bridges the gap between these two forms.

Material and methods

The type-locality of *A. w. azuay* is Bestión, 10,100' (c. 3,100 m), prov. Azuay, southern Ecuador (Chapman 1923). In November 1992 I collected seven adult males at Bestión (03°27'S, 79°03'W), at 3,000–3,075 m, on Cerro Carboncillo in prov. Loja (03°34'S, 79°12'W), at 2,875 m, and on the Altiplano of Tarqui in prov. Azuay (03°22'S, 79°11'W), at 3,000 m.

The song of each individual was tape-recorded before collection. The specimens are deposited in Academy of Natural Sciences of Philadelphia (ANSP), Museo Ecuatoriano de Ciencias Naturales (MECN), and Zoological Museum, University of Copenhagen (ZMUC). I compared three representative specimens of this series with the type of *A. w. azuay* in AMNH, and with specimens of closely related taxa in AMNH, ZMUC, and MECN. I also compared spectrograms and oscillograms of the songs of several taxa in the *Asthenes anthoides* superspecies, and performed playback experiments in the field in order to determine if *azuay* responded to the songs of these forms.

Results

Variation in the series

The most striking feature of the type of *A. w. azuay* is its almost entirely rufous wings, separating it from all its closest relatives. It has a buff underside like Peruvian *A. w. graminicola*, from which it was diagnosed by having darker and wider streaks on the back, a deeper coloured chin-patch, slightly shorter wing and tail, longer bill, fourth rectrix blackish only on the inner border of the inner web, and wings brighter and more extensively rufous (Chapman 1923).

TABLE 1

Measurements (mean $\pm$ SD, and range) of males of three forms of *Asthenes wyatti* and from one specimen between *A. w. azuay* and *A. w. aequatorialis*

Taxon	<i>aequatorialis</i>	intermediate	<i>azuay</i>	<i>graminicola</i>
Body mass (g)	21.5 $\pm$ 1.9 19.6–23.4 <i>n</i> =2	20.4 <i>n</i> =1	20.6 $\pm$ 1.1 19.1–22.4 <i>n</i> =6	—
Wing flat (mm)	68.2 $\pm$ 1.3 66–70 <i>n</i> =5	67 <i>n</i> =1	67.0 $\pm$ 2.1 65–71 <i>n</i> =7	71.5 $\pm$ 0.5 71–72 <i>n</i> =4
Tail (mm)	74.0 $\pm$ 2.3 71–77 <i>n</i> =5	72 <i>n</i> =1	71.4 $\pm$ 3.1 67–76 <i>n</i> =7	81.5 $\pm$ 1.5 80–84 <i>n</i> =4
Culmen to skull (mm)	18.6 $\pm$ 0.5 17.7–19.2 <i>n</i> =5	18.8 <i>n</i> =1	18.8 $\pm$ 0.4 18.0–19.3 <i>n</i> =6	16.6 $\pm$ 1.0 15.7–18.0 <i>n</i> =4

The new material of *A. w. azuay* demonstrates great variation in all these features. The only consistent difference in colour from Peruvian *A. w. graminicola* is the somewhat more rufous wings of *azuay*, but in this respect the type is extreme. All the others show less rufous, and some are barely different from *graminicola*. The series of *A. w. azuay* also appears much more similar to *A. w. aequatorialis* than does the type alone, and the northernmost specimen of *azuay* approaches *aequatorialis* in two characters. It has an almost wholly dark 4th rectrix with rufous only as a wedge along the shaft at the base of the inner web, and has the underside as pale as *A. w. aequatorialis*, the belly being deeper buffy grey in the rest of the series of *A. w. azuay* (including the type). Mensurally, the northernmost specimen of *A. w. azuay* does not differ from the rest of the series (Table 1).

In the new series of *A. w. azuay* the streaks on the back, although perhaps slightly darker, are no wider than on two specimens of *A. w. graminicola* from Junin and Cusco in Peru (ZMUC), but are wider than two other specimens from Junin (AMNH). The chin patch of *A. w. azuay* varies from white to rufous, and the colour is not correlated with age by skull ossification. Similar variation has been described for Venezuelan *A. w. mucuchiesi* (Phelps & Gilliard 1941).

In all seven recent specimens of *A. w. azuay* the two outer rectrices are wholly rufous. In five the third rectrix is similar, while this feather has a dusky wash along the edge of the inner web in two specimens. The fourth rectrix shows variable amounts of dusky along the mid edge of the inner web, ranging from a faint, 1 mm wide mark, to over half of the web in six of the specimens, three of which also have a narrow but distinct dusky line along the apical 2–4 cm of the shaft on the outer web. The seventh specimen approaches *aequatorialis* in two characters, as described above.

There is much overlap in the colour of the tail, but *A. w. azuay* averages intermediate between *A. w. aequatorialis* and the three central Peruvian specimens of *A. w. graminicola* in the amount of rufous on the 4th rectrix.

In both wing and tail colouration *A. w. aequatorialis* resembles Colombian *A. w. wyatti* and *A. w. sanctaemartae*, whereas Venezuelan *A. w. mucuchiesi* differs by having broad dusky edges on the basal halves of the inner webs of the three outer rectrices (Phelps & Gilliard 1941).

The only significant difference in measurements between *A. w. aequatorialis*, *A. w. azuay* and *A. w. graminicola* (Table 1) is the longer tail of *graminicola* (t-test, $p < 0.10$).

Distribution

No specimen has been obtained from the two populations of *Asthenes wyatti* geographically closest to the range of *azuay*, one found 30 km to the north-northwest, on the Cajas plateau west of Cuenca, prov. Azuay (pers. obs.), the other some 175 km to the south, at Cruz Blanca, depto. Piura in the western Andes of northern Peru (Parker *et al.* 1986). There is a large gap in the known range of the species between central and northernmost Peru, but this gap may be filled in future surveys. The species is easily overlooked, but its presence, in its rather species-poor dry grassland habitat, is betrayed by its song. However, it appears to be genuinely absent from Ecuador south of Río Zamora (pers. obs.).

Vocalizations

Playback experiments of songs of *A. w. graminicola*, *A. w. cuchacanchae* and *A. anthoides* all produced a marked response from both *A. w. azuay* and *A. w. aequatorialis*.

Songs of *aequatorialis* ($n=3$), *azuay* ($n=7$), *graminicola* ($n=2$), *cuchacanchae* ($n=2$), and *anthoides* ($n=1$) were analysed (B. Whitney and own recordings). Their songs, a single trill repeated at intervals, are indistinguishable, except for that of *anthoides*, which differs by not having the notes accelerated towards the end of the trill. Call notes of *A. w. aequatorialis*, *A. w. azuay* and *A. w. cuchacanchae* are also indistinguishable (call notes of *A. anthoides* were not available for this study).

Taxonomy

The taxonomic ranking of the twelve members of the *Asthenes anthoides* superspecies has differed considerably among authors (see discussion in Collar *et al.* 1992 and Vuilleumier 1997). I follow most authors in ranking *anthoides* as a distinct species, Austral Castanero, because of its noticeably different plumage and isolated range. The characters distinguishing the remaining taxa vary independently. The change from buffy to whitish underparts occurs between *A. w. azuay* and *A. w. aequatorialis*, whereas the northernmost form with a long tail is *A. w. graminicola*. Ridgely & Tudor (1994) allocated the eleven northern taxa to two species: Cordoba Castanero

Asthenes sclateri (with *lilloi*, *cuchacanchae* and *punensis*), and *Asthenes wyatti* (with *graminicola*, *azuay*, *aequatorialis*, *sanctaemartae*, *perijana* (Phelps 1977), and *mucuchiesi*, using the distinct change in tail pattern between *punensis* and *graminicola* as justification for ranking them as different species. However, as pointed out by Fjeldså & Krabbe (1990) and Vuilleumier (1997), birds from the Titicaca basin are variously intermediate between *punensis* and *graminicola*. Vuilleumier (1997) treated *anthoides* and *sclateri* as two monotypic species, referring all other forms to *A. wyatti*. Without recordings of the song of *sclateri* I cannot disagree with Vuilleumier's (1997) suggested taxonomy, but suspect that the morphologically poorly differentiated form *sclateri* is best ranked as a subspecies of *Asthenes wyatti*.

Discussion

Habitat

In southern Ecuador *A. w. azuay* is found in a semi-humid habitat on black soils with a mosaic of mature tussock grass and "chapparal" i.e. dense vegetation of a variety of bushes, small trees and ferns. In northern Ecuador *A. w. aequatorialis* is found in mature, dry, 0.5 m tall tussock grass on dry, sandy soils (often at very high elevations), with scattered bushes, cacti, or outstanding rocks that are used as song posts. It is known from the slopes of Volcán Cotopaxi (ZMUC) and from Volcán Chimborazo including the ridge both northwards to Volcán Iliniza and southwards to Ceche (AMNH, BMNH, MECN, and my own tape-recordings). Birds on the Cajas plateau, Azuay Province, occur in similar habitat (pers. obs) and probably belong here.

In Peru and Bolivia *A. w. graminicola*, *A. w. punensis* and *A. w. cuchacanchae* occur mainly in dry grassland like *A. w. aequatorialis* (pers. obs.) but once, near Sandia in Puno, I found *A. w. graminicola* in bushy vegetation (like *A. w. azuay*), which also seems to be the habitat used by Venezuelan *A. w. mucuchiesi* (Vuilleumier and Ewert 1978), and *A. anthoides* of Patagonia (Vuilleumier 1997). Also, *graminicola-punensis* intergrades were found to nest in rather dispersed *Polylepis* woodland with tall grass (a nest found in a *Polylepis* tree) near Lampa, in the Titicaca basin in 1987 (J. Fjeldså pers. comm.).

Speciation

The local distribution of their habitats, especially in the northern Andes, renders the different forms of *Asthenes wyatti* prone to differentiation. None of them is very distinct, however, probably owing to a fairly recent evolutionary history as well as to a high dispersal ability, as suggested by the species' presence in the isolated Santa Marta massif in northern Colombia.

Undiscovered populations may yet exist. An interesting, seemingly adult specimen in ZMUC (uncatalogued) labelled "Ecuador", presumably collected near Quito, differs from typical *A. w. aequatorialis* by having a darker and more extensive rufous in the wing, though not quite as much as in *A. w. azuay*, and from all other populations

by having narrow dusky brown streaks on the breast sides, sides, flanks and larger under tail-coverts. Another (AMNH 523763) labelled "Quito, Ecuador", also has distinctly more rufous in the wing than specimens from Cotopaxi and Chimborazo, and is paler above, but barely shows any streaks below.

In Ecuador both subspecies of *Asthenes wyatti* are replaced in tall, humid bunch grass by the Many-striped Castanero *Asthenes flammulata* (pers. obs.).

Conservation

Unlike *A. w. aequatorialis*, which has large populations in national parks, *A. w. azuay* is not known to occur in any protected area. Much of its "chapparal" habitat has been recently cleared but as it lives at high density, a sizeable population persists.

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Additions and annotations to the avifauna of Congo-Kinshasa (ex-Zaïre)

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Lippens & Wille (1976) summarized what was known of the avifauna of the country then named Zaïre, and that has since 1997 returned to its former name Congo (hereafter named Congo-Kinshasa, to avoid confusion with its neighbour on the northern bank of the River Congo, the Popular Republic of Congo or Congo-Brazzaville). Since 1976, a number of additions to their list have been published, which have recently been brought together in an updated checklist for the country by Dowsett (1993). The present paper adds further records, based on observations in the field and examination of skins at the Royal Museum for Central Africa (RMCA) at Tervuren, Belgium. Observations were made by the authors while resident in the country (RD 1988–1990, PH 1950–1960, TP 1990–1996), and by other observers, indicated by their initials in the text and named in the Acknowledgements. Records not followed by initials are thus our own; if other observers were also present, they are mentioned with a (+). All skins were examined by PH. For the sake of completeness we have, in some cases, included already published records which appear to have been overlooked by the major reference works. This paper is primarily intended as a supplement to Lippens & Wille (1976) and Dowsett (1993); reference should be made to the former to interpret fully the records given here, although we give a brief summary of the previously known status at the end of each species account. Where appropriate, reference has been made to *The birds of Africa* (Brown *et al.* 1982, Urban *et al.* 1986, Fry *et al.* 1988, Keith *et al.* 1992, Urban *et al.* 1997) to put the records into perspective or to indicate inaccuracies or inadequacies.

The information given includes the following: (1) twelve species (marked with *) recorded from Congo-Kinshasa for the first time or not mentioned by Dowsett (1993); (2) range extensions within the country; (3) additional information on species considered rare or threatened or for which there are few published records; (4) miscellaneous data on breeding, moult, vocalizations etc.

Names of towns and administrative entities have been subject to changes in the history of the country. Names of major towns and provinces used here are those in usage today and are identical to those in usage when the country was still Zaïre, except for the regions Bas-Zaïre, Haut-Zaïre and Shaba, which have become the provinces Bas-Congo, Orientale and Katanga respectively. However, the names of smaller administrative divisions dating from colonial times (when provinces were divided into districts, subdivided into territories) have been retained for records from that period, in order to facilitate comparison with already published data. For locations: see Appendix. The abbreviation NP stands for National Park. Sequence and nomenclature mainly follow *The birds of Africa* vols. I–V, complemented by Dowsett & Forbes-Watson (1993).

WHITE-CRESTED TIGER HERON *Tigriornis leucolophus*

In the Equateur province, nests with eggs or young were found in the south-eastern Tshuapa district in September, October (Herroelen 1955), December and January, whereas near Mbandaka nestlings were found in January, May and June, and in the north-western Ubangi district in October, December and May (VM). Neither Lippens & Wille (1976) nor Brown *et al.* (1982) mention any laying dates for Congo-Kinshasa.

BLACK HERON *Egretta ardesiaca*

Vitshumbi, Virunga NP, 24 April 1993, one. Rarely recorded in the Kivu region. All published records are from single birds on the southern shores of Lake Edward, the last in 1971 (Bataille *et al.* 1972, Verschuren 1978).

PURPLE HERON *Ardea purpurea*

Breeds in tall *Ceiba pentandra* trees in the swamp forests of the Ngiri, between the Ubangi and Congo Rivers, Equateur province (Vrijdagh 1954). Also recorded breeding in following territories: Kungu and Budjala, Ubangi district (AD, PRa & AP); 80–100 nests in tall trees in Bomongo, Equateur district (RDo); three colonies in Bikoro, Equateur district, April 1959 (Herroelen 1960). According to local inhabitants nesting also occurred on the lower Ngiri, at Bokwokoto and Gundu. Ten adults, 13 nestlings and three clutches were collected at Bokala-Budjala, December 1957, by PH's collector (specimens in RMCA). Lippens & Wille (1976), although stating that important breeding areas occur in the 'cuvette centrale', only mention Lake Mai-Ndombe, in N Bandundu.

SHOEBILL *Balaeniceps rex*

Virunga NP: Lulimbi, 16 and 17 May 1992, one with 45 Openbilled Storks *Anastomus lamelligerus*; Vitshumbi, March 1994, one (TG) and 20 April 1994, one (ML). There are only about ten published records from NE Congo-Kinshasa, all from the Lake Edward area (Curry-Lindahl 1961, Bataille *et al.* 1972, Verschuren 1978, Mertens 1986). but according to Mertens (1986) the species was seen several times at Lake Tchabuganga in 1966–1972.

SPOT-BREASTED IBIS *Bostrychia rara*

Precise laying dates for Congo-Kinshasa are lacking in Lippens & Wille (1976) and Brown *et al.* (1982). In the Equateur province, breeding activities recorded as follows: Lukolela, 26 September 1930, a female almost ready to lay collected (Chapin 1932); Bolima, 6 August 1954, a nest containing two young (Herroelen 1955); Bwamanda, 8 October 1959, a nestling collected; Bwamanda, 22 December 1961, a nest with two young (Schouteden 1962); Bokilio, 8 December 1964, a nest with two young (VM).

LESSER FLAMINGO *Phoeniconaias minor*

Goma, N Kivu, 28 September 1991, 23 flying northwards. There are few records from Congo-Kinshasa, all, except two, from the Lake Edward area: September 1960, 250–300; August 1961, several; August 1971, up to four; February–May 1974,

unsuccessful breeding attempt by c. 1,000 birds; in 1976, 1000s were reported to be still present, but by the end of 1977 all had gone; April 1988, 3,000+, with some visiting a site 60 km to the south; the birds were said to arrive yearly around January and to leave around September–October; in 1990 only a few were reported (Verschuren 1966, 1978 and 1991, Lippens & Wille 1976). There are two records from Banana, Congo River mouth: April 1952, 50 and July 1953, 200 (Mesmaekers 1953).

WHITE-BACKED DUCK *Thalassornis leuconotus*

Mongala district, NE Equateur, three juveniles collected on 6 January 1957, 30 November 1957 and 2 October 1958 respectively; Ubangi district, NW Equateur, two observed at Bokilio, 6 December 1964 (VM). Two birds were reportedly collected at the other side of the border, at Botambi, Central African Republic, on 26 November 1970, but the specimens could not be found and the species has been deleted from the country list (Dowsett *et al.* 1999). The occurrence of this species in NW Congo-Kinshasa is not mapped in Lippens & Wille (1976) nor in Brown *et al.* (1982). Breeding in the country is poorly known and has only been proved for E Kasaï, with four nestlings collected at Kasansa in July 1952 (Van Assche 1954 and *in litt.*).

***GADWALL** *Anas strepera*

Boguela, NE Equateur, 6 January 1957, an immature female collected and originally misidentified as Pintail *A. acuta*. The specimen, preserved at the RMCA, was re-identified by PH (Maes 1993). This Palearctic migrant, which winters mainly in NE Africa, is reported as “rarely recorded” in Congo-Kinshasa by Curry-Lindahl (1981) and as vagrant to the country by Brown *et al.* (1982); no details or references are given, however, and the source of these statements could not be traced.

COMMON TEAL *Anas crecca*

Garamba NP, 26 December 1951, an adult male collected. Third record for Congo-Kinshasa. The two earlier records were of immature female specimens obtained at Buta, Uele, 4 February 1935, and along the upper Semliki River, 11 December 1935 (Chapin 1954). All three specimens at RMCA.

[COMMON POCHARD *Aythya ferina*

Bataille *et al.* (1972) mention a sighting of two moulting males at the ‘lagune de Kasoso’, on the south-eastern shores of Lake Edward, 9 August 1971. This record, the only one to date, is not included in Lippens & Wille (1976) nor in Dowsett (1993). However, Brown *et al.* (1982) state that “very small numbers” of this species reach Congo-Kinshasa and on the accompanying map the north-eastern border area is indicated; unfortunately, no details or references are given, and the source of this statement could not be traced. Curry-Lindahl (1981) states that it has been recorded in “Zaire”, but does not give references. This Palearctic species is a fairly common migrant to central Sudan, October–March (Nikolaus 1987) but is rarely recorded at lower latitudes, in Uganda, Kenya and N Tanzania, from November to March (Britton 1980, Zimmerman *et al.* 1996). Given the odd date of the Lake Edward record and

the fact that it would constitute the first for the country, it cannot be accepted without further details.]

AFRICAN CUCKOO HAWK *Aviceda cuculoides*

Breeding: a nest with one egg, Tshuapa district, Equateur, 13 October 1951 (Herroelen 1955). No laying dates for Congo-Kinshasa in Brown *et al.* (1982).

BLACK KITE *Milvus migrans*

In the Equateur province, birds return in September–October and either occupy a nest from the previous year or start building a new nest; nest building may continue till December. Nests contain young during the low-water season, end December–April; young fledge mid March–mid May.

In the north-east of the country, in the Oriental province, Chapin (1932) found five nests with eggs and young in February–March. In the south-east, in Upemba NP, Verheyen (1953) noted egg-laying and incubation during the dry season, in July–August. Brown *et al.* (1982) give no breeding data for Congo-Kinshasa.

[EGYPTIAN VULTURE *Neophron percnopterus*

A sighting of an adult is claimed from Songa, 70 km north of Kamina, Katanga, 26 January 1984 (CR). Chapin (1932) and Lippens & Wille (1976) accept one previous claim, from SE Katanga, but according to Dowsett (1993 and *in litt.*) the occurrence of this species requires proof and records from south-central Africa should be treated with extreme caution, as sight records from Zambia are now believed to be misidentifications (of, for example, Palm-nut Vulture *Gypohierax angolensis*). Therefore, the species cannot yet be accepted for the country.]

***RÜPPELL'S GRIFFON VULTURE** *Gyps rueppellii*

Virunga NP: Lulimbi, September 1981 and 4 January 1982, one photographed (Mertens 1986); 25 October 1992 and 4 April 1993, two adults; Vitshumbi-Mwega, May 1989, one photographed (Verschuren 1991); Rwindi, September 1989, one photographed (Delvingt *et al.* 1990). Garamba NP, 14 February 1994, one adult. Local in neighbouring Uganda (Britton 1980) and mainly a dry season visitor to southern Sudan (Nikolaus 1987). Distribution map in Brown *et al.* (1982) shows range extending into NE Congo-Kinshasa, although there were no known records then.

BROWN SNAKE EAGLE *Circaetus cinereus*

An adult ringed at Assen, South Africa, 3 March 1974, was killed near Kabinda, E Kasai, 16 January 1981 (Oatley 1983); the bird had thus covered some 2,100 km. Brown *et al.* (1982) only mention irregular local movements.

BLACK-BREASTED SNAKE EAGLE *Circaetus gallicus pectoralis*

Garamba NP, 14 and 15 February 1994 (+LE & ML); 8, 10 and 11 February 1996 (MS & PR). Northernmost records in Congo-Kinshasa, but recorded (including breeding) just across the border in SE Sudan (Nikolaus 1987).

COMMON BUZZARD *Buteo buteo vulpinus*

Two records from the north-west, in Equateur: one collected at Bwamanda, 15 November 1957, and another shot at Iyonda, near Mbandaka, October or November 1954; of the latter only a few rectrices were preserved and subsequently identified by Chapin as belonging to this taxon (GM). Formerly known from the eastern part of the country only. There are, however, a few records further west, from NE Gabon (several) and Congo-Brazzaville (three) (Malbrant & Maclatchy 1949, Brosset & Erard 1986, Dowsett-Lemaire *et al.* 1993).

***NORTHERN CROWNED CRANE** *Balearica pavonina*

Garamba NP, occasional visitor observed in March–April (KS). Formerly known to occur as far south as the border area with Congo-Kinshasa in Sudan eastwards to N Uganda (Urban *et al.* 1986, Nikolaus 1987). In E Congo-Kinshasa its southern congener *B. regulorum* occurs north to Lake Albert and Nioka (pers. obs.).

PIED AVOCET *Recurvirostra avosetta*

Lulimbi, Virunga NP, 25 April 1992, 11; 26 April 1992, two (+ML); 16 May 1992, 13. Previously only one definite record, of a bird trapped at Lake Edward, 19 October 1971 (Lippens & Wille 1976). The record of a specimen said to have been collected at Banana, at the mouth of the Congo River, in 1816, was thought to need confirmation, as the bird might have been taken elsewhere (Chapin 1939).

GREY PRATINCOLE *Glareola cinerea*

In Equateur, PH found proof of breeding in February (nest scrapes) and March (nest containing one egg) and in July (19 clutches). These data suggest two breeding periods. Chapin (1939) mentions a nest containing a single egg at Lukolela on 9 August; Lippens & Wille (1976) found two nests in neighbouring Bandundu province, at Lake Mai-Ndombe, on 29 June, and along the Kwango River, on 7 July. Urban *et al.* (1986) do not mention laying dates for Congo-Kinshasa.

LESSER SAND PLOVER *Charadrius mongolus*

Lulimbi, Virunga NP, 24 and 25 October 1992, two (+ML); 4 April 1993, two (+ML). Ten birds are said to have been ringed at Lulimbi during the period 1970–1975 (d'Huart 1977), but as no notes on these records are available, they are best considered as in need of confirmation (Dowsett 1980). Lippens & Wille (1976) mention only one record.

GREY PLOVER *Pluvialis squatarola*

Muanda, Bas-Congo, 21 March 1991, one. Lulimbi, Virunga NP, 24 October 1992, one (+ML). Apparently rarely recorded in Congo-Kinshasa. We have traced twelve previous records, from following localities: Banana, Bas-Congo (three specimens, November and December); Muanda, Bas-Congo (one specimen, February); Bobito, Equateur (one specimen, October); Buta, Oriental province (one specimen); Panga, Oriental province (one specimen); Lukolela, Equateur (group of 20 on sandbank in

Congo River, March); Lulimbi, N Kivu (one trapped); Lake Edward, N Kivu (two singles, December–January and March); Katobwe, Katanga (one) (Chapin 1939, Maes 1961 and 1993, Lippens & Wille 1976, d'Huart 1977, Dowsett 1980, Mertens 1986).

***BAR-TAILED GODWIT** *Limosa lapponica*

Banana, Bas-Congo, 10 November 1990, two (+RS). The species is known to occur along the entire west coast of Africa; its presence in Congo-Kinshasa was to be expected.

TEMMINCK'S STINT *Calidris temminckii*

Lake Edward, 24 April 1993, one (+ML). Garamba River, Garamba NP, 14 February 1994, three; 15 February 1994, 12 (+LE & ML). First records for Garamba NP. At the Lulimbi ringing station, Virunga NP, 14 were ringed during three consecutive northern winters, 1972–1975 (d'Huart 1977). Lippens & Wille (1976) give details of three records only.

***HERRING GULL (HEUGLIN'S GULL)** *Larus argentatus heuglini*

Katanda Bay, SE Lake Edward, Virunga NP, 1 May 1994, two adults and one immature; 4 July 1994, one adult and one second-summer (ML). Field characters of adult birds corresponded with those of the race *heuglini*, which is treated as a full species by some authors (e.g. Zimmerman *et al.* 1996).

A Palearctic visitor to NE Africa, regular or semi-regular on the coast, e.g. Kenya, November–March; occasionally also reported inland at lakes in Ethiopia, Sudan, Uganda and Kenya (Britton 1980, Nikolaus 1987, Zimmerman *et al.* 1996, pers. obs). There is also a specimen from Burundi (Gaugris *et al.* 1981).

BLACK-HEADED GULL *Larus ridibundus*

Lulimbi, Virunga NP, 4 April 1993, one adult and one immature (+ML); 21 August 1993, three immatures (+ML); 22 August 1993, two immatures (+ML). Epulu River, Okapi Wildlife Reserve, Oriental province, 29 November 1995, one immature (MS & PR). Formerly only known from three records at Ishango, on the northern shore of Lake Edward, in March 1974 (Lippens & Wille 1976).

***LITTLE TERN** *Sterna albifrons*

Lulimbi, Virunga NP, 25 October 1992, min. 600; 3–4 April 1993, min. 800; 15 October 1993, min. 200; December 1993, none; 5 May 1994, 30 (ML). When first seen in October 1992, the birds were all in non-breeding plumage and therefore not separable from possible Saunders's Tern *S. saundersi*. By April 1993, however, they had moulted into breeding plumage and, through 25x telescopes, the white on the forehead was seen to extend well over the eye. During a visit to the same site in August 1993, no Little Terns were observed.

These represent the species' furthest inland records in central Africa. In Kenya, *albifrons*-like terns have been recorded on inland lakes and hundreds are sometimes present on Lake Turkana. Only two specimens have been collected so far, one adult

saundersi at Lake Turkana and one *albifrons* at Lake Naivasha; specific identity of Turkana birds remains uncertain (Zimmerman *et al.* 1996). In Sudan, Little Terns have not so far been recorded (Nikolaus 1987).

WHISKERED TERN *Chlidonias hybridus*

Virunga NP: Vitshumbi, 5 April 1992, 50; Lulimbi, 3 April 1993, 15 (+ML), 4 April 1993, ten (+ML). All records of birds in breeding plumage. Only one previous record from Lake Edward and another from Lukolela, Congo River, SW Equateur, of the Palearctic nominate ssp.; in S Katanga the African ssp. *sclateri* is known as a non-breeding visitor (Lippens & Wille 1976).

***BLACK TERN** *Chlidonias niger*

Boangi, SE Equateur, 17 September 1955, an adult collected on the Luilaka River. The locality, situated far inland, is remarkable. First definite record for Congo-Kinshasa; the skin (in RMCA) was originally misidentified as White-winged Black Tern *C. leucopterus*. According to Chapin (1939) a specimen from Banana, collected before 1876, may have been of this species.

EUROPEAN TURTLE DOVE *Streptopelia turtur*

Goma town, N Kivu, 18 May 1992, one. First sight record. Previously only known from four specimens, all immatures, collected at Avakubi, Oriental province (Chapin 1939), Boangi, S Equateur, Lulinga, S Kivu and Keseki, Bandundu (Louette 1988).

***BLACK-BILLED WOOD DOVE** *Turtur abyssinicus*

Garamba NP, 17 February 1994, two adults; 11 February 1996, one adult (PR & MS). Several other records from the period January–August (KS). Previously known to occur south to S Sudan and N Uganda (Urban *et al.* 1986, Nikolaus 1987).

SHELLEY'S EAGLE OWL *Bubo shelleyi*

Epulu, Okapi Wildlife Reserve, Oriental province, 3 September 1992, one adult allowing close approach in primary forest at the research station. Easternmost record of this rarely observed species, for which no details are given by Lippens & Wille (1976) and of which fewer than 20 specimens are said to be known (Fry *et al.* 1988). The other records from Congo-Kinshasa are: Avakubi, Oriental province, a feather collected in 1913 (Chapin 1939); Yangambi, Oriental province, 14 May 1950, an adult female (specimen in RMCA); Likati, Oriental province, 1 April 1952 (erroneously given as 1951 in Chapin 1954), a juvenile male (specimen at RMCA); Bunduki, Oriental province, a juvenile male, 4 November 1952 (died 7 November 1952; specimen at RMCA); Kabunga, N Kivu, a young female, probably captured early 1958 and acquired on 28 August 1959 by Antwerp Zoo, where it died in July 1970 (specimen at RMCA); Kisangani, Oriental province, 1959, two captive birds sent to Antwerp Zoo in 1959 (Chapin 1960, Schouteden 1966); Hombo, S Kivu, an adult female, 23 May 1971 (specimen at RMCA).

MOTTLED SWIFT *Tachymarptis aequatorialis*

Nsiamfumu, Bas-Congo, 10 November 1990, one in mixed group with European Swift *Apus apus* and Horus Swift *A. horus* (+RS). First record from SW Congo-Kinshasa; formerly only known from extreme east of the country (Fry *et al.* 1988).

SHINING-BLUE KINGFISHER *Alcedo quadribrachys*

Breeding records from Equateur: Ikela, SE Equateur: 8 October 1951, a nest with three young; 14 December 1952, a male incubating four eggs (Herroelen 1955); 21 January 1951, a pair seen at the entrance of a nest burrow. Mbandaka, 20 December 1957, a male incubating two eggs; 7 January 1958 an adult excavating a burrow. Bwamanda, NW Equateur, 31 December 1972, two nestlings in a hole in a rotting tree trunk near a swamp (VM). Fry *et al.* (1988) mention only one record, from the north-east of the country, where excavating was observed in October.

ROSY BEE-EATER *Merops malimbicus*

Breeding colonies found at Lilanga on the Ubangi River, 50 km WNW of Mbandaka, 15 April 1958, c. 200 nestholes, and near Bomenenge, 67 km downstream from Mbandaka on the Congo River, 22 April 1959, c. 100 nestholes in a sand bank. First definite records of colonies in Congo-Kinshasa.

LILAC-BREASTED ROLLER *Coracias caudata*

Rwindi, Virunga NP, 30 March 1991, one. Northernmost record; previously known to occur north to the Ruzizi Valley (Chapin 1939).

***BLUE-BELLIED ROLLER** *Coracias cyanogaster*

Gbadolite, Equateur: airport, 29 July 1995, two, and along Mobayi road, 24 September 1995, three. Only other records for Congo-Kinshasa are from Bili, also in Equateur, 11 November and 3 December 1989, 2 March and 3 April 1990 (Dejaifve 1990).

The map in Fry *et al.* (1988) shows the range extending into NE Congo-Kinshasa, although this is not mentioned in the accompanying text. In a later publication, however, the same author explicitly mentions the range to include the north-eastern part of the country (Fry *et al.* 1992). To our knowledge this had not been proven at the time, although Chapin (1939) suspected that the species might wander occasionally over Congo's northern border, since it had been recorded at Beso, Central African Republic, only a little north of the Ubangi River and at Kajo-Kaji near the Bahr-el-Jebel, S Sudan. From Sudan, only one other record, also from the extreme south, has been published since then (Nikolaus 1987).

BROAD-BILLED ROLLER *Eurystomus glaucurus*

Fry *et al.* (1988) state that nominate *glaucus* is a non-breeding visitor to E Congo-Kinshasa savannas, in February–November. Actually, its range is much larger, as it has been recorded from all over the country, including from the Equateur and Bas-Congo provinces in the west, and it not only frequents savanna, but also the whole of the forest zone. Migrants arrive in Katanga from the second half of February onwards,

reaching Kasai, Equateur and the extreme north-east of the country (Garamba NP) in March–April (earliest date for central Congo: adult collected at Ikela, SE Equateur, 17 February). The last adults leave the country early October, while immatures may be observed till the end of November.

Adults undergo a complete moult in February–August, secondaries moulting ascendantly from two centres at S1 and S5, rectrices starting with the central pair (R1), typically followed by the outermost pair (R6), then R2–R3–R4–R5; sometimes the outermost pair is moulted last (one of 23 birds examined). Juveniles have a partial moult in July–October, during which all body and tail feathers are replaced; moult sequence of rectrices similar to that of adults (for details see Herroelen 1964).

ABYSSINIAN GROUND HORNBILL *Bucorvus abyssinicus*

Between Kasenyi and the Semliki River, N Kivu, 1 September 1992, a pair. Southernmost record; previously known to occur south to northern shores of Lake Albert.

CASSIN'S HONEYBIRD *Prodotiscus insignis*

The distribution map in Fry *et al.* (1988) does not extend the range of this species to the central Congo basin, which is left blank, though with question marks. RMCA has specimens from three sites in Equateur, part of the blank area: Bamania (a juvenile collected on 15 October 1952); Bokeka (an adult female taken on 18 November 1955); Monieka (one collected on 31 October 1958). These specimens are included in Schouteden (1961).

WAHLBERG'S HONEYBIRD *Prodotiscus regulus*

Lulimbi, Virunga NP, 21 August 1993, two together (pair?). One of the birds called frequently while making short display flights over the tops of acacia trees. Northernmost record for Congo-Kinshasa, where previously only known to occur north to the northern shores of Lake Tanganyika (Lippens & Wille 1976); recorded, however, from Ruwenzori NP in SW Uganda (Fry *et al.* 1988).

GREATER HONEYGUIDE *Indicator indicator*

Nsiamfumu, Bas-Congo, 11 November 1990, a singing male (+RS); first record from the coastal area. Lippens & Wille (1976) and Fry *et al.* (1988) mention W Kasai as nearest range. Since then recorded from nearby Kouilou basin, Congo-Brazzaville, by Dowsett-Lemaire & Dowsett (1991).

NORTHERN WRYNECK *Jynx torquilla*

Lippens & Wille (1976) mention only one record for the country, in the extreme north-east. There is, however, a second specimen in RMCA, from Lima, north of Butembo, N Kivu, collected on 5 January 1959. This was included in Schouteden (1962, 1963), but subsequently overlooked and omitted in a work on the birds of the Kivu by the same author (Schouteden 1968, 1969a).

RED-THROATED WRYNECK *Jynx ruficollis*

The distribution map and accompanying range description in Fry *et al.* (1988) are incomplete: RMCA has 11 specimens from Businga territory, N Equateur (Schouteden 1962) and the species is also known from Duma (Chapin 1939), Bili and Sidi (Dejaifve 1990), in extreme NW and N Equateur. These records fill the gap, indicated by a question mark, on the above-mentioned map.

ELLIOT'S WOODPECKER *Dendropicus elliotii*

The range indicated on the distribution map in Fry *et al.* (1988) leaves a blank in the whole of the north-western part of the country. Snow & Louette (1981), however, have pointed out that there are records from this region.

BROWN-BACKED WOODPECKER *Picoides obsoletus*

There is a female specimen from Bobutu, N Equateur, collected on 27 October 1959, in RMCA. Not mentioned for the north-western part of the country in Fry *et al.* (1988).

WHITE-TAILED BUSH LARK *Mirafra albicauda*

Rwindi, Virunga NP, 24–25 April 1993, up to ten (+ML); 19 December 1993, two. Southernmost records for Congo-Kinshasa; few previous records.

SPIKE-HEELED LARK *Chersomanes albofasciata*

Schouteden (1969b) mentions a record of an adult female of the race *obscurata*, collected in the Kundelungu Highlands, December 1966. Although included in Lippens & Wille (1976), this record, the only one for the country, is not mentioned by Keith *et al.* (1992). Examination of the specimen proved the identification to be correct. The nearest records are from E Angola, in southern Lunda (Traylor 1963).

CONGO SAND MARTIN *Riparia congica*

Five specimens, collected by PH near Mbandaka on 7 April 1957, had subcutaneous fat on belly and rump; testes were well developed; plumage was faded and worn, but moult had not started yet. Although this species is generally regarded as non-migratory (Chapin 1953, Turner & Rose 1989, Keith *et al.* 1992), the presence of subcutaneous fat indicates that some migratory movements may occur. This could explain the presence of the species on the Ubangi River near Bangui, Central African Republic, where a specimen was collected on 24 March 1974 (Jehl 1976) and another, a female, on 7 May 1978 (Germain & Cornet 1994).

COMMON SAND MARTIN *Riparia riparia*

Nsele, Kinshasa, 25 February 1990, several. The map and accompanying account in Keith *et al.* (1992) do not mention the occurrence of the species in the south-western part of the country, although Lynes (1938) observed some with *R. congica* at 'Léopoldville' (now Kinshasa) in November 1933 and Lippens & Wille (1976) state that it sometimes occurs in huge flocks over the Congo River near Kinshasa.

[ETHIOPIAN SWALLOW *Hirundo aethiopica*

Lulimbi, Virunga NP, 80 said to have been ringed in the period 1971–75 (d'Huart 1977) would constitute the first records for the country. Unfortunately, no notes on these records are available, so that they are best considered as in need of confirmation. The species' occurrence in Congo-Kinshasa is likely, however, as it is known from nearby Ruwenzori NP on the Ugandan side of Lake Edward (Britton 1980).]

WHITE-THROATED BLUE SWALLOW *Hirundo nigrta*

Vocalizations of this species are poorly documented. Only Serle (1949) seems to have mentioned that "[this swallow] twitters sometimes on the wing". The following vocalizations were noted from a pair, building a nest on a concrete pole projecting less than 1 m above the surface of a forested lake at Kimwenza, near Kinshasa, on 16 June 1990. Calls included a vigorous *weetch*, a hard *vwhit*, *vwhit* and a soft *whit*, the last also given in flight. Song, only uttered by the presumed male, consisted of a soft, dry trill *prl-trrrrrrr* often mixed with disharmonic notes. Only the presumed female (which could be distinguished by a larger white throat patch and a somewhat duller plumage) was seen carrying nesting material and working on the nest, while in the meantime the presumed male perched nearby, occasionally singing.

GREY WAGTAIL *Motacilla cinerea*

Masisi highlands, N Kivu, 15 November 1993, four; 10 March 1994, one (ML). Few previous records.

LONG-LEGGED PIPIT *Anthus pallidiventris*

An immature female of the ssp. *esobe*, mislabelled as *A. leucophrys zenkeri*, was collected at Bwamanda, Equateur, on 15 September 1957. This locality is some 360 km NNE of Mbandaka, formerly known as the species' northernmost site (Keith *et al.* 1992). More to the west, it is now also known from as far north as Douala, Cameroon (R.J. Dowsett *in litt.*). Records from the low-water season (January–June) in Equateur suggest that the species occupies seasonally inundated grasslands, for example along the Ngiri and Sangha Rivers. Breeding season probably extends from July to January: a nest with a single young and one infertile egg was found on 7 September 1954 at Bolombo, 5 km E of Mbandaka (G. Michielsen *in litt.*); a recently fledged young was observed on 10 September 1958 in the same area; an adult was seen feeding a young bird on 3 February 1957 at Bamania; two juveniles were collected on 12 and 23 February 1954 at Iyonda. One of the three paratypes of *esobe* at RMCA, a juvenile, was collected on 3 January 1921 at Eala, Mbandaka.

The hitherto unknown juvenile plumage (based on the two specimens collected in February 1954) is as follows: feathers of head and upperparts blackish, very narrowly fringed sandy-buff; supercilium dull sandy-buff; moustachial stripe blackish; tail feathers narrow, blackish fringed rufous-brown; underparts whitish, heavily streaked blackish on breast, sparsely streaked on flanks, and washed pale brownish-cream on belly; upperwing-coverts brown, broadly fringed rufous-brown (gradually becoming narrower and fading to whitish with wear); flight feathers brown edged

and tipped rufous-brown, especially on secondaries and tertials; feather at carpal joint yellowish brown. Bare parts as in adults, but bill with pale gape.

TREE PIPIT *Anthus trivialis*

A male collected at Iyonda, near Mbandaka, on 27 December 1954. Not mentioned in Schouteden (1961). This is the southernmost record in the western part of the wintering range in Congo-Kinshasa. South of the country, however, the species is known to winter as far west as south-western Huila in SW Angola, further to the west than shown in Keith *et al.* (1992) (W.R.J. Dean in MS).

STRIPED PIPIT *Anthus lineiventris*

An adult male collected at km 48, Kamaniola Escarpment, S Kivu, on 1 July 1950. This is a considerable range extension, as the species was previously only known from Upemba NP, some 700 km to the south (Verheyen 1953). There are, however, three records from Akagera NP, Rwanda, which is nearer Kamaniola, at an even higher latitude (Vande weghe 1974; apparently overlooked by Keith *et al.* 1992).

RED-SHOULDERED CUCKOO-SHRIKE *Campephaga phoenicea*

Rutshuru plains, N Kivu, 3 October 1992, two adult males (+LE & ML); 2 November 1992, a pair at nest with young and an adult male 3 km further north; 6 February 1993, an adult male; 20 November 1993, two pairs. Tongo, N Kivu, 12 October 1992, an adult male. In eastern Congo-Kinshasa previously only known south to Irumu, some 500 km north of Tongo (Keith *et al.* 1992).

ANSORGE'S GREENBUL *Andropadus ansorgei*

Regularly recorded in forest patches in Kinshasa environs (Lac Ma Vallée, Kimwenza), Bombo-Lumene Game Reserve (Bateke Plateau) and Kolo-Yabi (JVL cattle ranch, Bas-Congo, 1989–90). Also Kisangani, Oriental province, May 1990. Distribution stated by Keith *et al.* (1992) to be uncertain in many areas due to confusion in the field with more widespread Little Grey Greenbul *A. gracilis*.

CAMEROON SOMBRE GREENBUL *Andropadus curvirostris*

The nest has not previously been described: one found at Belo, Ikela territory, Equateur, on 16 October 1950, consisted of a cup-shaped structure placed 1.5 m above ground and fastened onto the branch of a bush with yellowish spider web; outer layer of dry leaves, pieces of leaves and dry pieces of bark bound together with spider webs; inner layer of fine whitish plant fibres. The nest contained two nestlings about one week old, with brown-grey down, darker on back; iris brown; bill almost entirely black, gape yellow, mouth red, rear of tongue with fine dark wavy line; legs yellowish brown, feet slightly darker; claws grey. Begging calls *churr churr* and *tiu-tiut*.

PRIGOGINE'S GREENBUL *Chlorocichla prigoginei*

Forest near Djugu, Lendu Plateau, Oriental province, 7–8 February 1994, once observed singly and twice a single with a small group of Joyful Greenbuls *C. laetissima*

(+LE & ML; for details, see Pedersen 1997). First records since 1981 (Collar & Stuart 1985, Collar *et al.* 1994).

SIMPLE GREENBUL *Chlorocichla simplex*

This hitherto undescribed juvenile plumage is based on five specimens: plumage colouration similar to that of adult; rectrices slightly narrower and more pointed; iris dark brown; bill grey-brown with blackish base, gape yellow; legs and feet grey-blue, claws initially whitish (in nestlings) darkening to grey.

EQUATORIAL AKALAT *Sheppardia aequatorialis*

Nyiaragongo Volcano, N Kivu, 6 March 1992, two adults observed at *c.* 2,500 m. Formerly believed to be absent from the Kivu volcanoes (Lippens & Wille 1976).

THRUSH NIGHTINGALE *Luscinia luscinia*

Ishwa Plain, Oriental province, 10 February 1994, one singing (+LE & ML). Previously only a few records from the Katanga region, in the south-east of the country (Lippens & Wille 1976).

GREAT REED WARBLER *Acrocephalus arundinaceus*

Earliest collected specimen: 19 September, Nganza, W Kasai, first-year female; latest: 9 May, Kananga, W Kasai.

BUFF-THROATED APALIS *Apalis rufogularis*

Regularly recorded in forest patches in Kinshasa environs (Lac Ma Vallée, Kimwenza) and Kolo-Yabi (JVL cattle ranch, Bas-Congo, 1989–90). The range indicated on the distribution map in Urban *et al.* (1997) leaves a blank, with a question mark, in the south-western part of the country.

WOOD WARBLER *Phylloscopus sibilatrix*

The second ringing recovery in the country was of a bird of hitherto unknown origin but with a Russian ring, found near Bobito, Equateur, on 15 January 1960 (Schouteden 1962). This bird appears to have been ringed as nestling in the region of Pasvalys (56°3'N 24°20'E) on 24 June 1954 (A. Vinokurov *in litt.*).

***ORIOLE-WARBLER** *Hypergerus atriceps*

An adult was collected at Bwamanda, Equateur, on 1 November 1959, by VM (Schouteden 1962). This record was overlooked by Lippens & Wille (1976). Chapin (1953) mentions this species between brackets, thus indicating that it had not yet been recorded in the country, and notes that its distribution extends from W Africa “eastward to . . . the vicinity of the great bend of the Ubangi River”. Urban *et al.* (1997), having apparently misread Chapin (1953), state that the species occurs in “N Zaïre (near great bend of R. Ubangi)” and thus overlooked the Schouteden record.

BLACK-THROATED WATTLE-EYE *Platysteira peltata*

Nsiamfumu, Bas-Congo, 10 November 1990, a male (+RS). First coastal record. Nearest records are from W Kasai and Bolongongo, N Cuanza Norte, NW Angola;

no records from coast in Congo-Brazzaville or N Angola (Urban *et al.* 1997, W.R.J. Dean in MS). Garamba NP, 8–9 February 1996, two (PR & MS). Northernmost record. Previously only known to occur north to Lake Kivu.

CHIN-SPOT BATIS *Batis molitor*

Kolo-Yabi, Bas-Congo, 9 June 1990, a pair. This appears to be the first record from Lower Congo, where the closely related Black-headed Batis *B. minor* is the common representative of the genus. The sighting is interesting, considering that the two species are believed to be parapatric in Congo-Kinshasa by Louette (1987), who based this statement on the fact that only *B. minor* had been found in Lower Congo. At Kolo-Yabi, however, both appear to occur together, although *B. molitor* is probably uncommon or rare: during 13 visits to that site in 1989–1990 (totalling 35 days in the field), *B. molitor* was seen only once, whereas *B. minor* was almost invariably encountered when sufficient time was spent in the right habitat (lightly wooded savanna). Nearest records are from Kasai and from Djambala, Congo-Brazzaville, where a female was collected on 18 October 1951 (Rand *et al.* 1959). Despite the supposition that the species may be more widespread in Congo-Brazzaville than records suggest (Urban *et al.* 1997), it was not found during recent field work there and is thought to be very rare (Dowsett-Lemaire 1997b and pers. comm.). It was, however, recently found at Lékoni, SE Gabon (pers. obs.).

ANGOLA BATIS *Batis minulla*

Regularly observed in Bas-Congo and on the Bateke Plateau, 1989–1990. Vocalizations, stated to be unknown by Urban *et al.* (1997), included little buzzing calls and a series of weak, high-pitched, sucking whistles *heep heep heep* . . . (resembling description of song by Dowsett-Lemaire 1997a).

LITTLE PURPLE-BANDED SUNBIRD *Nectarinia bifasciata*

Garamba NP, 12 February 1996 (MS & PR). Previously only known to occur north to Rutshuru plains. Found in NW Uganda, some 200 km east of Garamba NP (Britton 1980).

WATTLED STARLING *Creatophora cinerea*

Two birds in non-breeding plumage were collected near Ikela, SE Equateur: an adult female at Yokolo, 8 April 1951, and an adult male, Mondombe, 9 April 1956. These constitute the only records for the Equateur province and the northernmost from the central and western part of the country.

***HOUSE SPARROW** *Passer domesticus*

Lubumbashi, Katanga, airport, 20 March 1991 (two) and 14 July 1995 (three); town, 5 January 1996 (four) and 8 May 1996 (one). Mbuji Mayi, E Kasai, town, 8 May 1996 (one).

Considering that the northward expansion of the species had already reached Ndola, just across the border in Zambia and only some 200 km south-east from Lubumbashi, in December 1966, and was at Lake Mweru in 1972 (Benson *et al.*

1971, Dowsett 1976), it seems remarkable that it has not been reported earlier from southern Congo-Kinshasa, although Summers-Smith (1998) in error quoted Harwin & Irwin (1966) as stating that it already was present there.

***BLACK-CHINNED WEAVER** *Ploceus nigrimentum*

Bankana, near Bombo-Lumene Game Reserve (Bateke Plateau), March 1991, a pair observed at close range in open savanna (MC). This record links up with the species' known range on the Bateke Plateau on the northern side of the Congo River, in Congo-Brazzaville and SE Gabon (Lékoni area); to the south it has only been recorded in the Bailundu Highlands of west-central Angola. Listed as 'Vulnerable' by Collar *et al.* (1994).

WEYNS'S WEAVER *Ploceus weynsi*

At Mbandaka, on 6 January 1959, a group of about 100 birds was seen to assemble with other *Ploceus* before dusk and to fly off in mixed groups to forested islands in the Congo River, where several hundreds of birds went to roost (PH). In Bokuma, about half of the birds at a tree roost containing several hundred of *Ploceus* were *P. weynsi* (GM).

Food (3 stomachs of males): fruit from *Beilschmiedia discolor* and *Alchornea cordifolia*. Breeding: on the basis of development of gonads of 13 specimens, breeding occurs from April (March?) to June. Moulting of remiges (specimens collected by PH and now at RMCA): adults (5 males, 1 female), mid-September to early November; juveniles (4 males, 1 female), mid-June to end October.

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Appendix: Gazetteer

Locality*	Province (Congo-Kinshasa) or Country**	Coordinates	
Akagera NP	Rwanda	1°32'S	30°38'E
Assen (Transvaal)	South Africa	25°11'S	27°36'E
Avakubi (Ituri)	Prov. Orientale	1°24'N	27°40'E
Bailundu Highlands	Angola c.	12°00'S	16°00'E
Bamania (Equateur)	Equateur	0°00'	18°20'E
Banana	Bas-Congo	6°00'S	12°25'E
Bankana	Kinshasa	4°38'S	16°24'E
Belo (Tshuapa)	Equateur	0°32'S	23°13'E
Beso	C.A.R.	5°07'N	19°29'E
Bili (Ubangi)	Equateur	4°34'N	19°43'E
Boangi (Monkoto)	Equateur	1°53'S	20°57'E
Bobito (Ubangi)	Equateur	2°57'N	19°25'E
Bobutu (Mongala)	Equateur	3°35'N	20°31'E
Boguela (Mongala)	Equateur	3°33'N	20°33'E
Bokala (Ubangi)	Equateur	2°10'N	19°32'E
Bokeka (Equateur)	Equateur	0°41'N	19°57'E
Bokilio (Ubangi)	Equateur	3°46'N	19°03'E
Bokuma (Equateur)	Equateur	0°06'S	18°41'E
Bokwokoto (Equateur)	Equateur	0°32'N	18°03'E
Bolima (Equateur)	Equateur	0°03'N	19°23'E
Bolongongo (Cuanza Norte)	Angola	8°28'S	15°16'E
Bombo-Lumene Game Reserve	Kinshasa	4°30'S	16°08'E
Bomenenge (Equateur)	Equateur	0°24'S	17°54'E
Botambi	C.A.R.	4°12'N	18°30'E
Budjala (Ubangi)	Equateur	2°39'N	19°42'E
Bunduki (Bas-Uele)	Prov. Orientale	2°29'N	23°20'E
Buta (Bas-Uele)	Prov. Orientale	2°49'N	24°50'E
Bwamanda (Ubangi)	Equateur	3°10'N	19°15'E
Djambala	Congo-Brazzaville	2°32'S	14°45'E
Djugu (Ituri)	Prov. Orientale	1°55'N	30°30'E
Duma (Ubangi)	Equateur	3°54'N	18°41'E
Eala (Equateur)	Equateur	0°04'N	18°20'E
Epulu (Ituri) Prov.	Orientale	1°23'N	28°36'E
Garamba NP	Prov. Orientale	c.4°13'N	29°24'E
Gbadolite	Equateur	4°14'N	20°59'E
Goma	Nord-Kivu	1°40'S	29°14'E
Gundu (Equateur)	Equateur	0°55'N	18°08'E
Hombo (Bukavu)	Sud-Kivu	1°52'S	28°27'E
Ikela (Tshuapa)	Equateur	1°08'S	23°05'E
Irumu	Prov. Orientale	1°29'N	29°51'E
Ishango, Lake Edward	Nord-Kivu	0°08'S	29°36'E
Ishwa Plain (Ituri)	Prov. Orientale	2°12'N	31°10'E
Iyonda (Equateur)	Equateur	0°01'S	18°13'E
Kabinda	Kasaï Oriental	6°8'S	24°29'E
Kabunga	Nord-Kivu	1°40'S	28°10'E
Kajo-Kaji	Sudan	3°52'N	31°40'E

Kamaniola	Sud-Kivu	2°46'S	29°00'E
Kananga (ex-Luluabourg)	Kasaï Occidental	5°53'S	22°26'E
Kasansa	Kasaï Oriental	6°33'S	23°44'E
Kasenyi	Nord-Kivu	1°23'N	30°26'E
Katanda Bay, Lake Edward	Nord-Kivu	0°51'S	29°22'E
Katobwe	Katanga	8°51'S	26°05'E
Keseki	Bandundu	2°07'S	16°32'E
Kimwenza	Kinshasa	4°27'S	15°18'E
Kisangani (ex-Stanleyville)	Prov. Orientale	0°33'N	25°14'E
Kolo-Yabi	Bas-Congo	5°25'S	14°49'E
Kundelungu Highlands	Katanga	c.10°00'S	27°50'E
Kungu (Ubangi)	Equateur	2°46'N	19°12'E
Lékoni	Gabon	1°34'S	14°13'E
Likati (Bas-Uele)	Prov. Orientale	3°20'N	23°57'E
Lilanga (Equateur)	Equateur	0°12'N	17°50'E
Lima (Beni)	Nord-Kivu	0°12'N	29°18'E
Lubumbashi (ex-Elisabethville)	Katanga	11°41'S	27°29'E
Lukolela (Equateur)	Equateur	1°07'S	17°11'E
Lulimbi, Virunga NP	Nord-Kivu	0°30'S	29°38'E
Lulinga	Sud-Kivu	2°20'S	27°36'E
Mai-Ndombe, Lake	Bandundu	2°00'S	18°20'E
Masisi Highlands	Nord-Kivu	c.1°24'S	28°49'E
Mbandaka (ex-Coquilhatville)	Equateur	0°04'N	18°16'E
Mbuji Mayi	Kasaï Oriental	6°10'S	23°39'E
Mondombe (Tshuapa)	Equateur	0°54'S	22°46'E
Monieka (Equateur)	Equateur	0°41'N	19°57'E
Muanda (=Moanda)	Bas-Congo	5°55'S	12°21'E
Ndola	Zambia	13°00'S	28°39'E
Nganza	Kasaï Occidental	5°58'S	22°28'E
Nioka (Ituri)	Prov. Orientale	2°09'N	30°40'E
Nsele	Kinshasa	4°18'S	15°18'E
Nsiamfumu	Bas-Congo	5°47'S	12°17'E
Nyiaragongo Volcano	Nord-Kivu	1°31'S	29°15'E
Okapi Wildlife Reserve	Prov. Orientale	1°45'N	28°30'E
Panga	Prov. Orientale	1°51'N	26°25'E
Ruwenzori NP	Uganda	0°15'N	29°57'E
Rwindi, Virunga NP	Nord-Kivu	0°47'S	29°17'E
Sidi (Ubangi)	Equateur	5°01'N	19°51'E
Songa	Katanga	8°06'S	25°01'E
Tongo	Nord-Kivu	1°13'S	29°19'E
Upemba NP	Katanga	c.9°10'S	26°40'E
Vitshumbi, Virunga NP	Nord-Kivu	0°39'S	29°22'E
Yangambi	Prov. Orientale	0°47'N	24°24'E
Yokolo (Tshuapa)	Equateur	0°36'S	23°04'E

*Administrative division between brackets; if mentioned for Congo-Kinshasa, this is the district, the division of the province before 1961.

**C.A.R.: Central African Republic.

Provinces in Congo-Kinshasa: Bas-Congo=Lower Congo, Prov. Orientale=Oriental province, Kasaï Occidental=West Kasaï, Kasaï Oriental=East Kasaï, Nord-Kivu=North Kivu, Sud-Kivu=South Kivu. Prov. Orientale and Katanga were formerly Haute-Zaire and Shaba respectively.

Distributional records from the highlands of the Serranía de Majé, an isolated mountain range in eastern Panama

by G. R. Angehr & D. G. Christian

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The Darién Highlands Endemic Bird Area, consisting of the highlands of eastern Panama above 700 m, has 11 restricted-range species (total world range of less than 50,000 km²) entirely confined to it, with another five restricted-range species found both there and in other areas (Stattersfield *et al.* 1998). In addition, several of the species of the Darién Lowlands Endemic Bird Area are primarily found in foothills and are essentially restricted to the lower slopes of the same highland areas.

These highlands consist of several isolated ranges running primarily northwest-southeast, parallel to the coastlines of the isthmus (Figure 1). One continuous

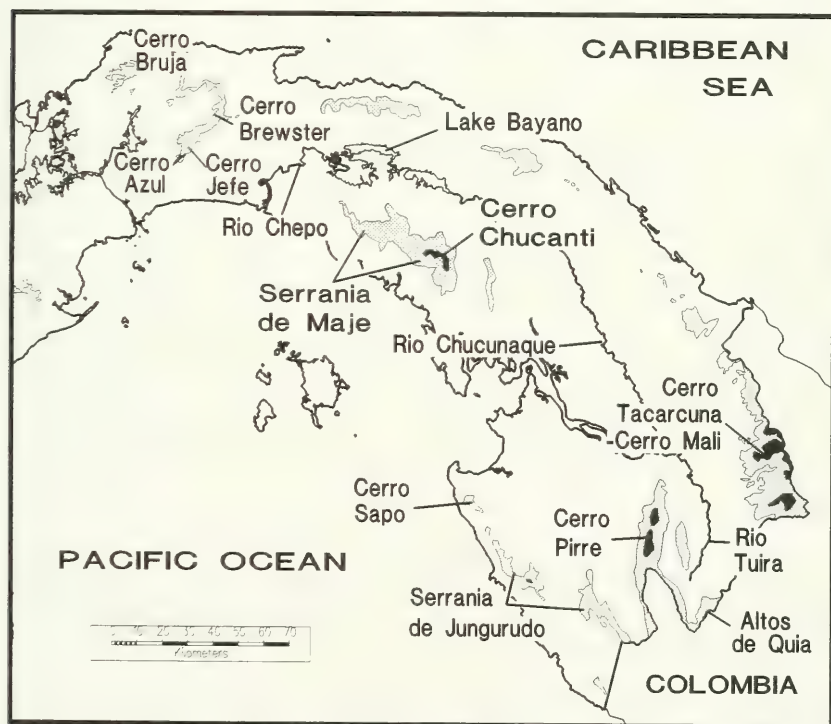


Figure 1. Mountain ranges of eastern Panama. Land above 700 m is indicated in grey and land above 1,200 m in black.

cordillera, 350 km long, runs close to the Atlantic coast from the Canal area to the Colombian border and forms the continental divide, reaching above 700 m only in its western (Cerros Bruja, Brewster, Azul, and Jefe) and eastern extremities (Cerro Tacarcuna-Cerro Malí). On the Pacific slope there are three isolated mountain ranges, which include the Serranía de Majé in the west, and Cerro Pirre (including its outlier, the Altos de Quía) and the Serranía de Jungurudó (including its outlier, Cerro Sapo) in the east.

The Serranía de Majé, c. 60 km long, is separated from the Atlantic coast cordillera by c. 30 km across the valleys of the Ríos Chepo and Chucunaque. The highest point in the range is at its eastern end, Cerro Chucantí (1,489 m, 8° 48' N, 78° 27' W), on the boundary between the provinces of Panamá and Darién. To the west, the Serranía is separated from the highlands of the Cerro Jefe (1,007 m) area by about 70 km. To the east, it is separated from the highlands of eastern Darién by about 125 km.

The highland areas of the Serranía de Majé have not previously been surveyed ornithologically. Alexander Wetmore visited the area in March 1950, ascending from Chimán on the coast via the village of Majé to approximately 630 m, according to his field notebooks (Department of Ornithology, National Museum of Natural History, Washington D.C.). The only restricted-range foothills and highlands species that he recorded were Russet-crowned Quail-Dove *Geotrygon goldmani*, Stripe-cheeked Woodpecker *Piculus collopterus*, and Black-crowned Antpitta *Pittasoma michleri*.

We conducted a preliminary survey of Cerro Chucantí from 27 August to 4 September 1996. Together with party members Alberto Castillo and Osvaldo Jordán, we ascended the mountain from the village of Buena Vista on its eastern side via a recently-constructed logging road. On 27 August we camped at 730 m, and ascended to a second camp at 1,240 m the following day. The lower limit of cloud forest (8-10 m canopy) on Cerro Chucantí was c. 1,150 m. We remained at this high camp until 2 September, working up as far as the peak at 1,489 m. We descended to the low camp on 3 September, and departed from the area the following day. We collected a small number of voucher specimens using mist-nets. Specimens have been deposited at the Museo de Vertebrados at the Universidad de Panamá. We report here primarily on species recorded within cloud forest, above an elevation of 1,150 m. Species of the Darien Lowlands Endemic Bird Area are indicated by an asterisk, and those of the Darien Highlands Endemic Bird Area are indicated by a double asterisk. Additional species occurring in cloud forest are listed in the Appendix.

CRESTED GUAN *Penelope purpurascens*

Small groups were seen or heard most days in the cloud forest, and once during the ascent between the low and high camps. This species is heavily hunted in Panama and is generally restricted to relatively inaccessible areas.

GREAT CURASSOW *Crax rubra*

A male and a female were seen separately by DGC at 1,300 m on 29 August. Like the previous species, the Great Curassow is a prized game species and its presence indicates relatively low hunting pressure.

****RUSSET-CROWNED QUAIL-DOVE** *Geotrygon goldmani*

One was heard calling and tape-recorded by DGC in the cloud forest at 1,240 m on 29 August. Wetmore collected one at 360 m on the south side of the range, and described it as the Majé endemic subspecies *oreas* (Wetmore 1968). Recorded from all of the other major highland areas of eastern Panama that have been surveyed, including Cerro Jefe, Cerro Brewster, (Ridgely & Gwynne 1989), Cerro Tacarcuna, and Cerro Pirre (Wetmore 1968), primarily 750-1,600 m. It is considered near-threatened (Collar *et al.* 1994).

VIOLET-HEADED HUMMINGBIRD *Klais guimeti*

One seen at 450 m on 3 September. The species is mentioned here because it was not recorded at higher elevations, even though it is common in foothills to 1,200 m elsewhere in Panama.

****VIOLET-CAPPED HUMMINGBIRD** *Goldmania violiceps*

Very common in cloud forest, also recorded down to 730 m. Otherwise known only from the Atlantic cordillera, including Cerro Bruja, Cerro Brewster, Cerro Jefe, and Cerro Azul in the west and Cerro Tacarcuna-Cerro Malí in the east; apparently replaced by the Rufous-cheeked Hummingbird *Goethalsia bella* on the two other Pacific-slope ranges, Cerro Pirre (Ridgely & Gwynne 1989) and the Serranía de Jungurudó (Cerro Sapo).

BLACK-THROATED TROGON *Trogon rufus*

This was apparently the only trogon regularly present in the cloud forest. Heard calling almost every day at the 1,240 m camp, and also heard at lower elevations. Somewhat surprisingly, the Collared Trogon *Trogon collaris*, which is common at similar elevations on Cerro Tacarcuna and Cerro Pirre (Ridgely & Gwynne 1989), appeared to be absent on Chucantí.

SPOTTED BARBTAIL *Premnoplex brunnescens*

One adult female was mist-netted and collected on 31 August at 1,240 m. Another individual was observed in the same vicinity on 1 September. The specimen was compared with the subspecies *brunneicauda* of Costa Rica and western Panama and *albescens* of Cerros Pirre and Tacarcuna, and does not appear to differ substantially from the latter.

****BEAUTIFUL TREERUNNER** *Margarornis bellulus*

Fairly common in the cloud forest, with a pair accompanying many of the mixed species flocks. These birds foraged primarily above 3 m, but occasionally lower. Previously known to occur only on Cerro Tacarcuna, Cerro Pirre and the Altos de Quía, where it is considered rare. On Cerros Tacarcuna and Pirre it occurs primarily above 1,350 m, but as low as 900 m on Cerro Quía (Ridgely & Gwynne 1989). This species has recently been assessed as "threatened" on the basis of having a very small range of less than 100 km² (Wege 1996).

FASCIATED ANTSHRIKE *Cymbilaimus lineatus*

Heard calling near the 1,240 m camp every day, and also recorded at lower elevations. This is unusually high for this species, which is normally found below 600 m, although it has been recorded to approximately 1,000 m in Darién (Ridgely & Gwynne 1989).

***BLACK-CROWNED ANTPITTA** *Pittasoma michleri*

Common in the cloud forest. Heard most days and one was mist-netted on 1 September at the 1,240 m camp. This is somewhat high for this species, which according to Ridgely & Gwynne (1989) occurs up to about 1,050 m.

SCALE-CRESTED PYGMY-TYRANT *Lophotriccus pileatus*

Recorded from the 730 m camp up to about 900 m. Surprisingly, not recorded at the 1,240 m camp.

RUFIOUS-BREASTED WREN *Thryothorus rutilus*

Recorded at the 730 m camp and up to about 900 m. This apparently represents the easternmost record for the species in Panama, and the first record for the province of Darién. The species was previously known to occur as far east as the area of Lake Bayano in eastern Panamá province (Ridgely & Gwynne 1989).

OCHRACEOUS WREN *Troglodytes ochraceus*

Not uncommon in the cloud forest and recorded every day. Elsewhere in eastern Panama this species is known only from the easternmost highlands, including Cerro Tacarcuna, Cerro Pirre and the Altos de Quía. It is not known to occur on Cerros Bruja, Brewster, or Jefe to the west, but reappears in the Talamanca range in western Panama.

****VARIED SOLITAIRE** *Myadestes coloratus*

Very common in the cloud forest. Two specimens were collected on 29 August, an immature and an adult male. This species is otherwise known only from Cerros Tacarcuna, Pirre and the Altos de Quía. There are no evident differences from specimens collected from these sites.

SLATE-THROATED REDSTART *Myioborus miniatus*

Common in the cloud forest, with a pair accompanying most mixed species flocks. An adult male was collected on 30 August and an adult female on 31 August. The specimens were compared with the subspecies *aurantiacus* of Costa Rica and western Panama and *ballux*, which ranges from Cerros Tacarcuna and Pirre into Colombia, Ecuador, and Venezuela, and does not appear to differ substantially from the latter. The species occurs on Cerros Jefe and Brewster but is rare there.

ORANGE-BELLIED EUPHONIA *Euphonia xanthogaster*

A male, seen once near the 1,240 m camp, was tape-recorded giving a call similar to that of this species (B. Whitney, pers. com.), which occurs between 400-1,500 m on Cerro Pirre, Cerro Sapo and the Altos de Quía. However, Yellow-crowned Euphonia

E. luteicapilla, cannot be ruled out entirely from our field observations, although this would be unusually high, and the wrong habitat, for this species (to 900 m, Ridgely & Gwynne (1989)).

****TACARCUNA BUSH-TANAGER** *Chlorospingus tacarcunae*

Fairly common in small flocks in the cloud forest. An adult female and an immature male were collected on 30 August. There is no apparent difference from specimens from Cerros Tacarcuna and Pirre. Otherwise occurs only in the Atlantic cordillera, being found on Cerros Bruja (GRA, unpublished data), Jefe, and Brewster in the west and Tacarcuna on the east. This species is replaced on Cerro Pirre and the Serranía de Junguradó (Cerro Sapo) by the Pirre Bush-Tanager *C. inornatus*.

***BLACK-AND-YELLOW TANAGER** *Chrysothlypis chrysomelas*

Uncommon with mixed species flocks in cloud forest. Elsewhere in eastern Panama this restricted-range species is common in foothills from 450-1,200 m (Ridgely & Gwynne 1989).

Conclusions

The distributions of several species appear to link the Serranía de Majé more closely to the Atlantic cordillera than to the other two ranges of the Pacific slope. The Violet-capped Hummingbird *Goldmania violiceps* occurs on Majé, as well as the Atlantic ranges to the east (Cerros Bruja, Brewster, Azul and Jefe) and to the west (Cerro Tacarcuna), but not on Cerros Pirre or on Cerro Sapo, where it is apparently replaced by the Rufous-cheeked Hummingbird *Goethalsia bella*. The Tacarcuna Bush-Tanager *Chlorospingus tacarcunae* has a similar distribution, being replaced on the other Pacific slope ranges by its congener the Pirre Bush-Tanager *C. inornatus*. Majé appears to lack the Speckled Antshrike *Xenornis setifrons*, which in Panama is found only in the Atlantic cordillera.

Due to the ruggedness of the terrain, the upper elevations of the Serranía de Majé are still virtually pristine. However, as in so many other parts of the tropics, the area is under threat from logging and agriculture. Our own access to the area was made possible by a new logging road that ascended to 800 m. The basin of the Río Majé itself, which flanks the northwestern part of Serranía, is officially protected as part of the watershed for Lake Bayano, a major hydroelectric project. Cerro Chucantí and the surrounding cloud forest at present receives no official protection. Given the presence of several species of extremely limited distribution, some form of protection would be highly desirable.

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and Joaquin Barbara assisted with transport. We also are grateful to ANAM, Panama's Environmental Authority, for providing the research permits under which this work was carried out. Gary Stiles provided helpful comments on the original manuscript. GRA would also like to thank the collections staff at the American Museum of Natural History in New York and the National Museum of Natural History in Washington D.C. for permission to examine specimens under their care.

Appendix. Additional species recorded in cloud forest on Cerro Chucantí

White Hawk *Leucopternis albigollis*, Black Hawk-Eagle *Spizaetus tyrannus*, Ornate Hawk-Eagle *Spizaetus ornatus*, Barred Forest-Falcon *Micrastur ruficollis*, Mottled Owl *Ciccaba virgata*, Green Hermit *Phaethornis givv*, Little Hermit *Phaethornis longuemareus*, Purple-crowned Fairy *Heliothryx barroti*, Emerald Toucanet *Aulacorhynchus prasinus*, Yellow-eared Toucanet *Selenidera spectabilis*, Olivaceous Piculet *Picumnus olivaceus*, Plain Xenops *Xenops minutus*, Spotted Woodcreeper *Xiphorhynchus erythropygius*, Brown-billed Scythebill *Campylorhamphus pusillus*, Russet Antshrike *Thamnistes anabatinus*, Plain Antvireo *Dysithamnus mentalis*, Slaty Antwren *Myrmotherula schisticolor*, Paltry Tyrannulet *Zimmerius vilissimus*, Olive-striped Flycatcher *Mionectes olivaceus*, Eye-ringed Flatbill *Rhynchocyclus brevirostris*, White-throated Spadebill *Platyrinchus mystaceus*, Eastern Wood-pewee *Contopus virens*, Bright-rumped Attila *Attila spadiceus*, White-ruffed Manakin *Corapipo leucorrhoa*, Gray-breasted Wood-wren *Henicorhina leucophrys*, Southern Nightingale-wren *Microcerculus marginatus*, Pale-vented Thrush *Turdus obsoletus*, Bananaquit *Coereba flaveola*, Silver-throated Tanager *Tangara icterocephala*, Bay-headed Tanager *Tangara gyrola*, Hepatic Tanager *Piranga flava*, Chestnut-capped Brush-finch *Buarremon brunneinucha*.

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New species and amendments to the avifauna of Cameroon

by R. J. Dowsett & F. Dowsett-Lemaire

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During field work in Cameroon since 1997 we have confirmed the presence of two species not accepted for the country by Louette (1981) nor by Dowsett (1993) and found nine species completely new for the country's list. At the same time, examination of the literature has revealed a number of species hitherto overlooked, as well as a few misidentifications. Co-ordinates are given for localities not detailed by Louette (1981). (PM) denotes a Palearctic migrant.

COMMON BUZZARD *Buteo buteo*

(PM) While an earlier record was not accepted by Louette (1981), the species has since been identified on Mt Oku, 31 October to 3 November 1988 by Holyoak & Seddon (1990), and we saw an example on 16 February 1998.

[AUGUR BUZZARD *Buteo augur*

Sørensen *et al.* (1996) have claimed a sighting of a female of this species north of the Bénoué National Park. As mentioned by those authors, this is very far from the known range of this eastern African species, and the record is difficult to accept in the absence of any evidence.]

AYRES'S HAWK EAGLE *Hieraaetus ayresii*

A pair of adults and a juvenile were well seen 22 and 24 April 1997, at Boulou swamp in Lobéké (2°10'N, 15°43'E). They were circling and then perching on the edge of the swamp (probably attracted by the large numbers of Grey Parrots *Psittacus erithacus* and Green Pigeons *Treron australis* coming to the salt-pan). A pair was again seen in the area in April 1999, circling together with a pair of Cassin's Hawk Eagles *Spizaetus africanus* (a species whose noisy aerial display makes it far more noticeable). These are the first acceptable records of this species for the country: Louette (1981) mentioned that he had been unable to trace the various specimens mentioned in the literature for Cameroon, and so he preferred to consider them unproven. We have received details of subsequent sightings from Buffle Noir in the Bénoué National Park (8°7'N, 13°50'E) (N. Borrow *in litt.*) and several in western Cameroon (Clark 1999; R. Demey and M. Languy, pers. comm.).

LESSER KESTREL *Falco naumanni*

(PM) Although Dowsett (1993) accepted this species on the Cameroon list on the basis of a bird reportedly seen on 7 September 1985 at Ngaoundéré (Wilson 1989), we do not now believe that record (on an exceptionally early date) to be correct. The majority of the range extensions reported by that author have regrettably been found

to be erroneous, for example six forest species claimed from Mt Oku but not found by subsequent ornithologists (Dowsett-Lemaire & Dowsett 1998b). These were doubtless the result of misidentifications (see also *Hirundo albigularis*, below), but there are acceptable records of this kestrel by Thiollay (1978), Scholte *et al.* (1999), and others.

COMMON QUAIL *Coturnix coturnix*

(PM) A specimen was collected on Mt Manenguba, 25 March 1948 (Serle 1950). There have subsequently been sight records from Waza, 25 March 1993 and 7 February 1995 (Scholte *et al.* 1999).

SPOTTED CRAKE *Porzana porzana*

(PM) On 22 November 1997 one was seen well, if briefly, in thicket on the edge of a small marsh near the Sanaga river bridge, between Yaoundé and Bafia (4°23'N, 11°15'E) (RJD, J. DeMarco).

[RED-CRESTED TURACO *Tauraco erythrophus*

Accepted by Dowsett (1993) on the basis of a sight record from the south coast at Kribi (A. Forbes-Watson, in Fry *et al.* 1988). However, this species has not been found in recent investigations in southern Cameroon and Equatorial Guinea (various observers), and was rejected for Gabon (P. Christy in Dowsett 1993), so we think it best treated as unproven at present.]

BARRED OWLET *Glaucidium capense*

First discovered in Lobéké reserve, in the south-east, in April 1997. Five were calling along a distance of 2 km in open-canopy semi-evergreen forest near Lobéké stream (2°17'N, 15°40'E), with another heard off the road in the same habitat near Boulou camp (2°09'N, 15°44'E). Densities were checked with playback experiments, as the species responds very well to tape-recordings. Subsequently, in December-January 1997-98, we found the species common in tall *Triplochiton* forest on the edge of Mala swamp in Nki reserve (2°12'N, 14°39'E) and more local in Boumba-Bek reserve (2°33'N, 15°07'E).

The species was only recently discovered in central Africa, in 1994 in Central African Republic and 1996 in northern Congo-Brazzaville (Dowsett-Lemaire & Dowsett 1998a, Dowsett *et al.* 1999); the race of this population has not been determined but is likely to be *castaneum*, known from further east in E. Congo-Kinshasa (Democratic Republic of Congo, ex-Zaïre). A forest population is also known further west in Ivory Coast (*ethecopari*).

?PRIGOGINE'S NIGHTJAR *Caprimulgus "prigoginei"*

A nightjar singing in fairly dense forest at 2100 h, 1.2 km east of Boulou camp (Lobéké), 21 April 1997, was producing the long series of "tchoc-tchoc-tchoc-tchoc-tchoc..." notes, also tape-recorded at Ndoki in nearby Congo-Brazzaville (Dowsett-Lemaire & Dowsett 1998a) and in the Itombwe Forest, E. Congo-Kinshasa (ex-Zaïre),

by T. Butynski in 1996 (sonograms clearly show all of these recordings to belong to the same species). Playback of the Itombwe tape provoked a vocal reaction (louder song and short calls "rek, rek", also heard at Ndoki). It was not found again in April 1999. Also heard in forest in Nki (Mala) and Kupandaka (2°12'N, 14°51'E) in December-January 1997-98. It is either an undescribed species, or more likely Prigogine's Nightjar, the third forest species in Africa, known from only one specimen from the Itombwe in E. Congo-Kinshasa (ex-Zaire) (Louette 1990), given that T. Butynski's tape, identical to ours, comes from the Itombwe locality.

SCARCE SWIFT *Schoutedenapus myoptilus*

We saw and heard this species on several occasions in the crater of Mt Manenguba on 7 and 8 February 1999, including a flock of some 50. The birds were feeding over forest around the south and east rims of the crater, at an altitude of 1,900-2,200 m. A tape-recording was made. The species is very noisy and indeed the best way of locating it is its characteristic call, a series of clicks, short trills and high-pitched, nasal twittering (a description and sonogram are presented by Dowsett & Dowsett-Lemaire 1978).

Its discovery in Cameroon was not unexpected, as this widespread montane swift was already known on the western side of Africa from the highlands of Angola and Bioko (Fry *et al.* 1988). They could occur elsewhere along the Cameroon chain of mountains, especially on Mt Cameroon. Some reports of Bates's Swift *Apus batesi* by Stuart (1986) and colleagues over Mt Cameroon and Manenguba may have resulted from confusion with Scarce Swift (S. Stuart, *in litt.* 1999) and, indeed, the remark by M. Gartshore (*in litt.* 1999) that those black swifts were "very noisy" suggests Scarce rather than Bates's, normally a silent species, whose voice has still not been tape-recorded (C. Chappuis, pers. comm.). On the other hand, Scarce Swifts are probably absent from the lower montane forests of the Kupe-Bakossi area, as we failed to find them in some three months of field work there recently.

ALPINE SWIFT *Apus melba*

(PM?) Dowsett (1993) overlooked a reported sighting from Mt Cameroon, 17 January 1984 (Stuart 1986). FDL saw one at Buffle Noir (Bénoué) on 10 March 1999, and published reports include those of Rodewald *et al.* (1994) and Scholte *et al.* (1996).

PALLID SWIFT *Apus pallidus*

(PM?) Dowsett (1993) overlooked a reported sighting from Mt Oku, 28 March and 2 April 1984 (Stuart 1986). There have since been reports from Waza on 8 June 1993 (Scholte *et al.* 1999). The date of June would be surprising for a Palearctic migrant, but it is known to breed in the Sahara, and suspected to do so in Mali (Fry *et al.* 1988).

GOLDEN-TAILED WOODPECKER *Campethera abingoni*

In March 1999 this bird was common in semi-evergreen *Celtis* and *Diospyros* forest along the Bénoué river in the south of Bénoué National Park. It was particularly in

evidence around the Camp of Buffle Noir. It was more local in the north of the park, in dense riparian *Diospyros/Anogeissus* forest. In Faro National Park it is common in the beautiful riparian forest along the river about the Camp des Hippos (8°23'N, 12°49'E), and we also heard it at the Faro crossing in the south (8°12'N, 13°00'E), in dense riparian forest.

Stuart (1986) reported one seen 17 February 1984 at 2,000 m on Mt Manenguba, in montane woodland. This is based on a sighting by C. Bowden (*in litt.* 1999), who feels now, however, that this record requires confirmation. We failed to find the species on Manenguba in 1999.

While it is widespread in *Brachystegia* and other woodland south of the Equator, this species is very patchily distributed to the north, being replaced in Sudanian (= Guinea) woodland by the Fine-spotted Woodpecker *C. punctuligera* (Short in Fry *et al.* 1988). These are sympatric in the Bénoué plain but ecologically separated, with *C. punctuligera* confined to woodland.

[WHITE-THROATED SWALLOW *Hirundo albigularis*

This migrant from southern Africa has been claimed from Kumbo, 20 July 1985, by Wilson (1989). But in view of many misidentifications in that work (see above, under Lesser Kestrel), this species cannot be accepted, and there is no evidence that it ranges north of the Guineo-Congolian forest block.]

GREY WAGTAIL *Motacilla cinerea*

(PM) One was well seen at a waterfall on the Boumba river, Boumba-Bek reserve (2°41'N, 15°13'E), 28 November 1997 (FDL). It was alongside Mountain Wagtail *M. clara* and African Pied Wagtail *M. aguimp*.

TAWNY PIPIT *Anthus campestris*

(PM) At Waza, a specimen was collected on 7 February 1974 (van den Elzen 1975). Subsequently, a party of five were reported there 18 October 1994 (Scholte *et al.* 1999).

BLACK-EARED WHEATEAR *Oenanthe hispanica*

(PM) A male was collected at Waza, 10 February 1974 (van den Elzen 1975), and two later sightings in the far north are mentioned by Scholte *et al.* (1999). De Greling (1972) reported seeing a bird with the characters of the race *seebohmi* of the Northern Wheatear *O. oenanthe* at Waza, 30 & 31 March 1966; Black-eared Wheatear, which it resembles, is perhaps more likely.

SAVI'S WARBLER *Locustella luscinioides*

(PM) Fry (1970) reported seeing two birds well in Waza, late November 1969.

UGANDA WOODLAND WARBLER *Phylloscopus budongoensis*

Several singing individuals were located in the tall forest canopy of Lobéké reserve, at c. 450 m especially along streams, in April 1997 and again in 1999. Some were

seen well, attracted into view by the playback of a tape. It was also found commonly in Boumba-Bek and Nki reserves, always above 400 m. This represents a northward extension of the known range of this mid-altitude species, recently discovered in Congo and Gabon (Dowsett-Lemaire & Dowsett 1996, 1998a), and also in Monte Alen National Park in mainland Equatorial Guinea (Dowsett-Lemaire & Dowsett 1999).

YELLOW-BREASTED APALIS *Apalis flavida*

In March 1999, in the Bénoué National Park, this warbler was common in semi-evergreen forest and thicket along the Bénoué river. Similarly, in the Faro N.P. it is common from the confluence of the Faro and Déo rivers (8°31'N, 12°43'E), south to the Faro crossing (8°12'N, 13°00'E). Not included by Louette (1981), for the reason given by Dowsett (1993), this species has also been reported from south-western Cameroon (Green 1996) and the Adamaoua Plateau (R. Demey, M. Languy, and other observers, pers. comm.).

BLACK BISHOP *Euplectes gierowii*

The remarkable extension of range occasioned by the discovery of this species at localities in the Ijim area (6°13'N, 10°20'E) will be detailed in full elsewhere (C. Bowden & J. DeMarco *in litt.*). Only two breeding sites are known, the other being on the road from Belo to Bamenda, at about 6°08'N, 10°15'E, where FDL, L.D.C. Fishpool and J. DeMarco saw a male in breeding dress on 28 September 1998. The nearest known population is at Bangui, in Central African Republic (Germain & Cornet 1994), some 800 km to the east.

CHAD FIREFINCH *Lagonosticta (rhodopareia) umbrinodorsalis*

This firefinch is known in Cameroon only from the type locality, Old Sakjé, in the Bénoué N.P. at 8°12'N, 13°46'E (Reichenow 1911). Although Dowsett & Forbes-Watson (1993) treated it as a form of *L. rhodopareia*, following Payne & Louette (1983), they omitted it from the Cameroon list. Payne (1998) now considers *L. umbrinodorsalis* to be specifically distinct.

LOCUST FINCH *Ortygospiza locustella*

One calling and flying over the dambo (seasonally wet grassland) at Boulou (Lobéké reserve) on 23 April 1997 is the first record for the country. We subsequently found it (a group of 4) in short moist grassland in Boumba-Bek "Grande Savane" in December 1997. It was already known from dambos in N. Congo-Brazzaville but not from nearby Central African Republic.

Additional species

In addition to the above, the following species have been reported for the first time since the publication of Dowsett (1993): Kurrichane Buttonquail *Turnix sylvatica* (Christy 1994, Scholte *et al.* 1999); Little Gull *Larus minutus* (PM) (Quantrill &

Quantrill 1995); Kemp's Longbill *Macrosphenus kempii* (Rodewald & Bowden 1995); Imperial Eagle *Aquila heliaca* (PM), Terek Sandpiper *Xenus cinereus* (PM), Broad-billed Sandpiper *Limicola falcinellus* (PM), Whiskered Tern *Chlidonias hybridus* (PM?), Isabelline Wheatear *Oenanthe isabellina* (PM) and possible Collared Flycatcher *Ficedula albicollis* (PM) (Sørensen *et al.* 1996); Black-billed Barbet *Lybius guifsobalito* (van Beirs 1997); European Spoonbill *Platalea leucorodia* (PM), Greater Flamingo *Phoenicopterus ruber* (PM?), Nubian Bustard *Neotis nuba*, Red-crested Korhaan *Eupodotis ruficrista* and Lesser Black-winged Plover *Vanellus lugubris* (Scholte *et al.* 1999: note that most of the species claimed as new by these authors had already been reported in print from elsewhere); Scaly-fronted Warbler *Spiloptila clamans* (van Beirs 1999).

We accept the proposed splitting of *Terpsiphone rufocinerea* into Rufous-vented Paradise Flycatcher *T. rufocinerea* and Bates's Paradise Flycatcher *T. batesi* (Erard *in* Urban *et al.* 1997): both occur in Cameroon (see Louette, 1981, where treated as a single species).

Dowsett (1993) presented a list of 874 species for Cameroon. With the addition of 35 species documented above (including *Caprimulgus sp. ? prigoginei* and *Terpsiphone batesi*, but excluding *Ficedula albicollis* for the moment), and the deletion of *Tauraco erythrolophus*, the avifauna becomes 908 species.

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Notes on the Crested *Cnemophilus macgregorii* and Yellow-breasted *Loboparadisea sericea* Birds of Paradise

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The birds of paradise (Paradisaeidae) are the best known bird family from New Guinea, their centre of distribution. Although a considerable amount of information exists on the 42 family members (Frith & Beehler 1998), much remains to be learned because many species have restricted ranges and live in rugged and isolated areas rarely visited by ornithologists.

Here we report some incidental observations on two such poorly-known species. These observations were made during the course of biological survey work on Crater Mountain, Eastern Highlands Province, Papua New Guinea. Observations were made at three survey camps:

- *Aedo Camp* – 145° 06' E, 6° 42' S; 1,450 m elevation, 5-24 May 1996; lower to mid-montane primary forest.
- *Arosele Camp* – 145° 08' E, 6° 34' S; 1,950 m elevation, 28 September-30 October 1998, montane primary forest.
- *Maimafu Camp* – 145° 04' E, 6° 33' S; 2,800 m elevation, 13 January- 3 February 1999, upper montane primary forest.

Crested Bird of Paradise *Cnemophilus macgregorii*

This species occurs patchily in the central cordillera of New Guinea at higher elevations (usually 2,600-3,500 m) in mossy forest. Little is known of the male displays or mating system. While the nest of *C. macgregorii* is well-known, only egg fragments have been described. A nest and egg collected by A. S. Anthony were described by Rothschild (1898) as being from this species. However, Hartert (1910) expressed doubt about these because they were substantially different from nests and eggs at that time known from other family members. The nest was known from a single observation (Sims 1956) until 1988 when the Friths discovered nests, but no eggs at Tari Gap, Southern Highlands Province, Papua New Guinea (Frith & Frith 1993). They demonstrated that the nest and egg reported by Rothschild (1898) were misidentified.

On 15 January 1999 we discovered a *C. macgregorii* nest at the Maimafu Camp. The nest was similar in construction and location to those described and illustrated by Frith & Frith (1993). It was embedded in the thick moss encompassing a vertical tree trunk c. 20 cm diameter, 2.2 m above ground on the downhill side of the tree on a fairly steep slope. A few stems of an epiphytic orchid grew from both sides of the domed nest and appeared to support it. Unidentified monocotyledon stems that lined the inside of the nest protruded from the entrance located at the side of the nest.

Because of the dense moss layer covering every surface at this site, the nest was very well camouflaged and difficult to locate.

In the nest was a single egg that, by the unblemished translucence of its shell, appeared to be recently laid. The egg measured 38.9 x 25.8 mm. The base colour was a uniform, pale Salmon Colour (colour 106, Smithe 1975), mottled with dull Flesh Ochre (colour 132D, Smithe 1975) markings c. 0.5-1.5 mm long, sparsely on the narrow end, getting denser toward the broad end, there forming an indistinct ring. Superimposed over the base colour and mottling were a few slightly larger markings that were redder, Mahogany Red (colour 132B, Smithe 1975). These markings were also denser toward the broad end, helping to form the ring. Thus the egg fairly closely resembled the egg of *C. loriae* pictured in Frith & Beehler (plate 13, 1998); however the purple-grey markings of the *C. loriae* egg (Frith & Frith 1994) were replaced by narrower Mahogany Red markings on the *C. macgregorii* egg.

The nest and egg were not collected, but photographs of them are deposited in the Academy of Natural Sciences VIREO collection. We checked the nest several times daily and never found evidence of an attending male. The female was still incubating the single egg when we departed the camp on 3 February, 19 days after finding the egg.

While at Maimafu Camp, tape-recordings were made of quiet churring, similar to that described by Rand (Mayr & Rand 1937) as "two timbers rubbing together," and a loud snapping from a female-plumaged bird. Another note rarely heard from female-plumaged birds was a quiet, harsh growl. The adult female's alarm vocalizations in the vicinity of her nest were similar, but louder, harsher and persistent, sounding like scraping or like heavy material being torn. An adult male was observed making a call similar in quality, but shorter, louder and more emphatic "*grwhaa*" that was given once every few minutes. On playback of this call a male investigated but gave no more vocalization. Tape-recordings of these vocalizations are deposited at the Cornell Library of Natural Sounds.

At the Maimafu camp six *C. macgregorii* were mist-netted. Four of the six were in heavy moult. Two female-plumaged birds weighed 81 g and males (adult and subadult) were 91, 95, 95 and 96 g. Males were apparently of the race *sanguineus* based on their deep red-orange dorsal colouration (Frith & Beehler 1998).

Yellow-breasted Bird of Paradise *Loboparadisea sericea*

This is the most poorly-known genus of bird of paradise; the mating system, nest, egg and displays are undescribed. It is patchily distributed and usually uncommon or difficult to locate, perhaps due to it being a canopy-dwelling species (Coates 1990).

We found the species fairly common at both the Aedo and Arosele camps. At Aedo several individuals were observed and one was mist-netted. At Arosele the species was much more common; birds were seen several times and nine individuals were captured (among 325 captures) in mist nets set in the forest understorey. We are unfamiliar with its vocalizations and all birds observed were silent.

An adult male was observed feeding on fruits from an unidentified vine in the lower canopy, one captured bird regurgitated a seed about 1 cm diameter, and one bird collected had small seeds, possibly *Ficus*, in the gut. Observations of birds were usually too brief to note behaviour. All were solitary and unobtrusive in the upper midstorey or lower canopy and none seemed to be associated with mixed foraging flocks or aggregations at fruiting trees. We suspect their food is mostly fruits; none exhibited obvious insect-foraging behaviour (like pulling apart moss tangles or searching limb surfaces). Although all mist-netted birds were caught within 2 m of the ground, we did not observe individuals so close to the ground.

Two specimens were collected, one (AM 843) is deposited at the Bernice P. Bishop Museum, Honolulu and the second (AM 1082) at the PNG National Museum, Port Moresby. Most of the birds captured exhibited light moult of body contour feathers, none had remige moult and two had a single retrix in moult. None had a brood patch. The juvenile male (AM 1082) collected 6 October 1998 had enlarged testes (left testis 9.1 x 3.2 mm).

Four of the males captured 6-22 October 1998 were juveniles. Two were photographed (photographs deposited in the VIREO collection, Academy of Natural Sciences). These young males had fleshy nasal wattles that were mostly fully developed but not quite as swollen as those of adult males. Most notable, however, was that the nasal wattle was either completely black or in one case black becoming mottled with the turquoise-green colour of the adult male. This is the first report of this colouration in the wattle and suggests that the wattle form develops first then acquires its bright colouration. The plumage of these juvenile males was in transition to adult plumage from the described plumage of a first year immature (Frith & Beehler 1998).

Both species discussed here are members of the Cnemophilinae, the basal subfamily of the Paradisaeidae (Frith & Beehler 1998). Much attention has been devoted to the evolution of the extravagant plumage and mating systems in the birds of paradise, particularly among the Paradisaeinae. If the Cnemophilines are indeed the basal cluster in the family, a better knowledge of them is required for studies of evolution within the family to be properly rooted. Crater Mountain would be an ideal site for study of these two species.

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New distributional sightings of 28 species of birds from Dpto. Nariño, SW Colombia

by Ralf Strewe

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Recent fieldwork by the author during a two-year study (August 1996 – July 1998) of the biogeography and altitudinal migration of tanagers *Thraupinae* within the Chocó Endemic Bird Area of Pacific Colombia (Strewe 1999) has yielded noteworthy distributional records of birds, including new distributional records for Dpto. Nariño, for the Pacific slope in Nariño and one species new to Colombia. Much of the information included in this paper results from avifaunal surveys within the project area along an altitudinal gradient from 400 to 3,200 m on the Pacific slope in Nariño. Additionally, excursions were made to different localities in Nariño.

The majority of records included herein were obtained at 8 localities:

- (1) Miraflores, a small village on the NW slope of the Volcan Cumbal at 2,800 m (1°02'N, 77°52'W). Humid montane forest at altitudes between 2,500 to 3,200 m were surveyed in the vicinity of this village.
- (2) La Planada Nature Reserve (1°09'N, 77°58'W) protects c. 2,500 ha of wet premontane forest at 1,800-2,100 m.
- (3) Rio Ñambi Nature Reserve (1°18'N, 78°05'W) includes pluvial premontane forest at 1,000-1,600 m (c. 1,500 ha).
- (4) El Pangan Nature Reserve, established 1998 (c. 1,000 ha, 1°21'N, 78°04'W), includes pluvial premontane forest in the lower Rio Ñambi valley at 600-1,400 m.
- (5) Pueblo Nuevo, a small village at the foot of the Andes (390 m) surrounded by wet lowland and foothill forest (1°29'N, 78°14'W).
- (6) The Upper Patía valley was visited during a two-day excursion on 4-5 January 1998; dry thickets and secondary forests on the W slope of the valley around the villages Leiva and El Rosario (950-1,200 m) were surveyed.

- (7) Playa Mulato, a narrow sandy island within the Sanquianga National Park north-east of Tumaco, visited during a four-day excursion in March 1997.
- (8) La Cocha, a lake south-east of Pasto on the eastern slope of the Andes at 2,700 m (1°05'N, 77°09'W). Small private reserves protect some of the remaining Andean forest around the lake.

Species accounts

TAWNY-BREASTED TINAMOU *Nothocercus julius*

On 2 October 1997 an adult with 3 juveniles was seen foraging on a small trail in fairly open montane humid forest on the NW slope of Volcan Cumbal at 3,200 m, representing the first record for Dpto. Nariño. The species is known from all three Andean ranges in Colombia and N Ecuador in Dpto. Pichincha (Fjeldsa & Krabbe 1990, Hilty & Brown 1986).

SOUTHERN LAPWING *Vanellus chilensis*

Two adults were observed foraging in a meadow in the upper Patía valley close to the village Leiva (1,100 m) on 4 January 1998. The species was unrecorded for Dpto. Nariño, but known in suitable habitat to S Dpto. Cauca (Haffer 1986, Hilty & Brown 1986).

RED-NECKED PHALAROPE *Phalaropus lobatus*

The species appears to be a regular winter visitor along the Pacific coast of Colombia (Hilty & Brown 1986). On 23 March 1997 two groups of 8 and 14 winter plumaged individuals were observed in the ocean a few km off the coast of Playa Mulato, Sanquianga National Park.

ANDEAN GULL *Larus serranus*

During several visits to the Lagune La Cocha individuals or small flocks were recorded, including 8 birds on 30 November 1997 along the W shore of the lake, and 13 birds (8 adults and 5 juveniles) on 3 January 2000 in the El Encano River delta (photographs). Previously known from open high Andean marshes and lake-shores north to N Ecuador (Fjeldsa & Krabbe 1990).

ELEGANT TERN *Thalasseus elegans*

The sighting of an adult on 20 October 1996 in a flock of Royal Terns *Thalasseus maximus* flying south close to the beach of Boca Grande island, Tumacó (1°49'N, 78°46'W), represents the first record for Dpto. Nariño. The winter plumaged adult showed a long, slender, slightly decurved orange bill, a solid black crown extending around the eye and a more deeply forked tail than *Thalasseus maximus*. Another record for Chocó exists from the Buenaventura Bay, with one individual seen on 3 March 1979. As a pelagic migrant the species probably visits coastal waters in Pacific Colombia rarely (Hilty & Brown 1986).

WHITE-THROATED HAWK *Buteo albigula*

The species is known from W Andes in Colombia at Munchique and at El Tambo, Dpto. Cauca, and from both slopes in N Ecuador (pers. obs.), but has not been cited

from Nariño (Fjeldsa & Krabbe 1990, Hilty & Brown 1986, Thiollay 1991). The first location for Dpto. Nariño is the Miraflores valley on the NW slope of Volcan Cumbal; single birds were observed on 23 June 1997 and on 3 October 1997, soaring during midday over steep slopes with degraded humid montane forest and secondary forest (2,800-3,200 m).

PEARL KITE *Gampsonyx swainsonii*

During a two-day excursion to the upper Patía valley two individuals were observed pearching on poles close to the village Leiva (1,100 m) in very degraded dry forest habitat on the western slope of the valley on 4 January 1998. The species has been recorded from the Magdalena valley south to Dpto. Cundinamarca-Tolima boundary, but not from the Cauca valley (Hilty & Brown 1986).

ORNATE HAWK-EAGLE *Spizaetus ornatus*

During fieldwork on the Pacific slope in Dpto. Nariño this species was observed at altitudes between 500-1,900 m; pairs were recorded regularly in the Nambi valley in pluvial premontane forest at 1,400 m and lower at 600-1,000 m. In October-December 1997 the species was present in the La Planada Nature Reserve at 1,950 m, with an adult soaring and calling intensively (tape-recording). In the Colombian Pacific region, the species had been known previously south to the Anchicaña Valley, Dpto. Cauca, and rarely in N Ecuador, Dpto. Esmeraldas (October 1997 Estacion Biológica Jatun Sacha Bilsa, pers. obs.) (Hilty & Brown 1986). Thiollay (1991) did not record the species in his study area, but he mentioned that the species is likely to occur in the coastal plain of Dpto. Nariño.

BAUDÓ GUAN *Penelope ortonii*

This threatened and restricted-range species is rare in the Pacific lowlands and foothills in W Colombia and N Ecuador (Collar *et al.* 1994, Stattersfield *et al.* 1998). It is known in Colombia from the Baudó mountains, Dpto. Chocó, the Anchicaña Valley and below Cerro Munchique, Dpto. Cauca (Hilty & Brown 1986). Salaman (1994) described a female killed by local indians from the Rio Nambi valley. The first observations for Dpto. Nariño are from the same valley within the El Pangan Nature Reserve. On 3 July 1997 one individual was observed on a steep slope (820 m) in pluvial premontane forest, and on 4 May 1998 four birds were seen feeding high up in the canopy of a relatively open primary forest (750 m). The owners of the private reserve reported the species as not uncommon; it seems that a healthy population exists within the reserve.

SHORT-EARED OWL *Asio flammeus*

Hilty & Brown (1986) noted that the species probably occurs in the paramó zone of S Dpto. Nariño, as the species is known from N Ecuador (Fjeldsa & Krabbe 1990). Its occurrence in Nariño is confirmed by the observations of three individuals on 28 September 1996 at Lago Cumbal (3,700 m) and of one bird hunting in extensive reed-marshes of the La Cocha Lagune (2,700 m) on 30 December 1997 and 3 January 2000 (photograph).

BRONZY INCA *Coeligena coeligena*

On 10 August 1996 a single individual was observed (photograph) at a forest border in La Planada (1,840 m). This observation represents the first record for the Pacific slope in Dpto. Nariño; previous records are restricted to the Pacific slope south to Dpto. Cauca (Fjeldsa & Krabbe 1990, Hilty & Brown 1986).

WHITE-BELLIED WOODSTAR *Acestrura mulsant*

The species is uncommon and local in the Central and East Andes south to Dpto. Nariño (Hilty & Brown 1986), and mainly reported on the W slope in Ecuador (Fjeldsa & Krabbe 1990). Distribution on the Pacific slope in Dpto. Nariño was confirmed by observations of a female on 6 November 1997 and a pair on 16 February 1998 at humid montane forest borders in the Miraflores area (2,600-2,800 m). Females differ from the Gorgeted Woodstar *Acestrura heliodor*, which was observed within the same area, by an all green rump and white centre of lower breast and belly; males of *A. heliodor* have a much darker green plumage and are missing the white belly of *A. mulsant*.

VIOLACEOUS TROGON *Trogon violaceus*

On 4 December 1996 two females were observed at a forest border close to the village of Pueblo Nuevo (480 m), and in July 1997 a male perched in a forest clearing in the same area (420 m). Previously the species was not recorded for the Pacific region in Colombia, but records exist for W Ecuador (Hilty & Brown 1986). The continued deforestation in SW Colombia probably permitted a northward range extension of this species.

WHITE-FACED PUFFBIRD *Hapaloptila castanea*

The species is generally rare and local, and only known from a few scattered localities in Colombia (Fjeldsa & Krabbe 1990, Hilty & Brown 1986). Records exist from the ridges in La Planada (1,900-2,100 m) (including pers. obs.). On 1 October 1997 a single individual was recorded within a forest gap on a steep slope of the upper Miraflores valley at 2,370 m; another bird was observed along a ridge at 2,670 m following a mixed-species flock on 8 May 1998.

SPOT-BREASTED WOODPECKER *Chrysoptilus punctigula*

One male was observed on 4 January 1998 constructing a nest cavity at a secondary forest border in the upper Patía Valley, representing the first record for this valley. This widespread nonforest species was previously reported in W Colombia south only to Buenaventura and in the Cauca Valley south to Cali (Hilty & Brown 1986).

CHESTNUT-NAPED ANTPITTA *Grallaria nuchalis*

The species is known in Colombia from both slopes of the Central Andes south to Dpto. Cauca, from the W slope of East Andes (*ruficeps*) (Hilty & Brown 1986), and is recorded in NW and NE Ecuador (*obsoleta*) (Fjeldsa & Krabbe 1990, Ridgely & Tudor 1994). The species was fairly common in the Lagune La Cocha area (2,700-3,100 m), for example within the private Tunguragua Nature Reserve, where the

species was regularly heard (tape-recordings) and observed in forest undergrowth with dense bamboo thickets.

RUFOUS ANTPITTA *Grallaria rufula*

The first records for the Pacific slope of the W Andes in Dpto. Nariño come from humid montane forest at Miraflores (3,200-3,400 m), where individuals were observed and heard (tape-recordings) in undergrowth of dense primary forest close to the treeline. The species is also reported from the east slope in Dpto. Nariño (pers. obs.) and W Ecuador (Fjeldsa & Krabbe 1990, Hilty & Brown 1986).

MOUNTAIN ELAENIA *Elaenia frantzii*

On most of the visits during my fieldwork the species was recorded on the NW slope of Volcan Cumbal (>2,400 m) and in the Lagune La Cocha area (2,700 m), including a bird mist-netted (photograph). The species is uncommon in cultivated areas with hedges and at forest edges around the village Miraflores. In comparison to the Sierran *Elaenia* *Elaenia pallatangae* the birds showed neither a crown-patch nor a crest and the underparts were uniform pale yellowish olive with a slightly paler throat. Previously, the species was known from all three Andean ranges north of Dpto. Nariño (Fjeldsa & Krabbe 1990, Hilty & Brown 1986, Ridgely & Tudor 1994).

CATTLE TYRANT *Machetornis rixosus*

The first record for Dpto. Nariño comes from the upper Patia valley, where two birds were seen foraging in gardens and meadows close to the village of Remolino on 5 January 1997. The species has been recorded once in the Pacific region at Buenaventura (3 March 1979) and no records exist for the Andean valleys in Colombia (Hilty & Brown 1986, Ridgely & Tudor 1994). Deforestation has probably permitted this species to enter the Patía Valley from northern Colombia in recent years.

SIRYSTES *Sirystes sibilator*

This species had been recorded for the Pacific region in the northern Chocó (south to the Baudó mountains) and in W Ecuador (October 1997 pers. obs.). On 4 December 1996 one individual was seen at a forest border close to Pueblo Nuevo at 480 m, representing the first record for Dpto. Nariño. The bird showed two broad white wingbars, broad white edgings and a black tail tipped white, characteristic for the trans Andean *albogriseus*, which may be a different species (Hilty & Brown 1986, Ridgely & Tudor 1994, Stotz *et al.* 1996).

PALE-EDGED FLYCATCHER *Myiarchus cephalotes*

The species is known from all three Andean ranges in Colombia, but with only few records from the Pacific slope (Fjeldsa & Krabbe 1990, Hilty & Brown 1986). One individual was observed on 17 February 1997 at a humid montane forest border at 2,560 m, which represents the first record for the Pacific slope in Dpto. Nariño.

PLAIN-TAILED WREN *Thryothorus euophrys*

In Colombia the species is only known from the slopes of Volcan Chiles close to the border of Ecuador in S Dpto. Nariño (Fjeldsa & Krabbe 1990, Salaman 1994). The

fieldwork on the slopes of the neighbouring Volcan Cumbal produced records (observations and tape-recordings) in tangled forest borders at 2,300-2,650 m.

TROPICAL MOCKINGBIRD *Mimus gilvus*

According to Ridgely & Tudor (1994) this species is distributed in non-forested regions of western Colombia south to the upper Patía valley in S Dpto. Cauca. The species was first noted in cultivated areas below La Planada at 1,550 m on 26 August 1996; later it was regularly recorded up to 2,000 m. It is benefiting from the destruction of the forest ecosystems in this area.

CHOCÓ VIREO *Vireo masteri*

This threatened endemic species is known from two sites on the Pacific slope of the W Andes at 1,200-1,600 m (Salaman & Stiles 1996, Stattersfield *et al.* 1998). The species is well known from the Rio Nambi Nature Reserve. On 26 January 1998 two individuals were observed in lower parts of the Rio Nambi Valley within the El Pangan Nature Reserve at 850 m. The observation represents an altitudinal extension of 350 m.

WHITE-SHOULDERED TANAGER *Tachyphonus luctuosus*

Several records, including one pair at a forest border high up in the canopy at Pueblo Nuevo represent the first records for the Pacific region in Dpto. Nariño. The record is not surprising as the species is known from humid forested regions in the N Chocó south to Dpto. Valle and from W Ecuador (Hilty & Brown 1986, Isler & Isler 1999, Ridgely & Tudor 1989).

RUFIOUS-CHESTED TANAGER *Thlypopsis ornata*

The species is known from the W slope of the Central Andes in Dpto. Cauca (Hilty & Brown 1986, Isler & Isler 1999) and the slopes of Volcan Chiles, Nariño (Salaman 1994). The new locations for this species in Colombia are Volcan Cumbal, where several individuals or pairs were observed in humid montane shrubbery and edge of cloud forest at altitudes between 2,600-3,200 m, and the E slope of Volcan Galeras (observation of three individuals at 2,800 m in December 1999).

LARGE-BILLED SEED-FINCH *Oryzoborus crassirostris*

A male was observed in secondary growth foraging with a flock of Seed eaters *Sporophila sp.* near the village Leiva (1,100 m) in the upper Patía valley on 4 January 1998. This is the first record for Dpto. Nariño; it is previously known from the Cauca Valley south to Medellin and the upper Patía valley at El Bordo, Dpto. Cauca (Haffer 1986, Hilty & Brown 1986).

BLACK-AND-WHITE SEEDEATER *Sporophila luctuosa*

After a period of heavy burning of large areas in the Volcan Cumbal region, three times a single male was observed accompanying flocks of Yellow-bellied Seed eater *Sporophila nigricollis* on 21 and 24 September 1997 and on 15 November 1997 in the La Planada area (1,600-1,850 m). Large flocks of Seed eaters (Variable Seed eater

Sporophila americana and *Sporophila nigricollis*), foraged during this period on the unburned grassy slopes at the edge of humid forest in the vicinity of the reserve. The species is known locally in subtropical and lower temperate zone from all three Andean ranges in Colombia and in the Central Andes south to Dpto. Cauca (Hilty & Brown 1986), and is also recorded in N Ecuador on both slopes (Fjeldsa & Krabbe 1990).

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Description of eggs and young of the Fox Kestrel *Falco alopex* in Niger

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The Fox Kestrel *Falco alopex* is a poorly known raptor endemic to the Sahel. A computer literature search in Zoological Record produced no references and there is also not a single reference to it in Dowsett *et al.* (1997). Details of the species are given in handbooks (Brown *et al.* 1982, Del Hoyo *et al.* 1994) or distributional lists (e.g. Balança & De Visscher 1993, Bretagnolle 1993). The species breeds during the rains or late dry season, depending on location (Brown *et al.* 1982, Elgood *et al.* 1994). Brown *et al.* (1982) and Del Hoyo *et al.* (1994) state that it lays 2–3 eggs. The eggs resemble those of kestrels, being round ovals, buff or reddish with darker red spots. Brown and colleagues also mention that there is no accurate description of the downy young, but that they are probably white.

In south-west Niger, Fox Kestrels are quite frequently seen near steep cliffs that offer suitable locations for breeding, and probably also for roosting (Giraudoux *et al.* 1988, pers. obs.). Such cliffs are found for instance just west of the capital, Niamey, as well as along the Niger river 20 km further south, where several pairs of Fox Kestrels live. Many more such cliffs are found along the Dallol Bosso, a relatively narrow (5–15 km) rift valley, between Birini N'Gaouré (13°41'N, 2°54'E) and Filingué (14°21'N, 3°19'E), 100 km east of Niamey. These cliffs consist of sandstone from Continental Terminal deposits of Tertiary age, and in their faces are many small ledges and cavities, suitable for nesting. The average annual rainfall in the area is 4–500 mm (Sahel zone). The natural vegetation below the cliffs consists of open shrub land on sandy soil, now mostly cleared for pearl millet cultivation. On the plateaux at the top of the cliffs the vegetation is mostly tigerbush, a type of patterned vegetation where bands of crusted bare soil alternate with dense bands of 2–6 m high bushes. The bands run more or less parallel to the contours and each band is 10–30 m wide.

During the breeding season we have found pairs of Fox Kestrels at a minimum of six different locations in the Dallol Bosso. In our third year of excursions to the Dallol we finally found an accessible nest, on 4 June 1994, 12 km south-west of Baleyara, in the cliffs next to the road to Yadé, between Kogori and Sandiré (13°41'N, 2°54'E). The nest was *c.* 2.5 m up a vertical, 10 m high cliff, located at the top of a scree slope 12–15 m long. The nesting site was a hole 25 cm high, 15 cm across and 60 cm deep. On the bare floor, 15 cm from the entrance, there were 4 eggs, buff with dark red markings as described by Brown *et al.* (1982). On a subsequent visit, on 12 June, the nest was inspected from *c.* 3 m below the nest entrance, using a mirror attached to an aluminium tube. There were two downy young, approximately 1–2 days old, and two eggs. The colour of the young was pale greyish-buff, approximately matching the colour of the surrounding sandstone. The cere were orange. The young

were very noisy, constantly calling shrilly, and could be heard from the foot of the escarpment. This attracted our attention as soon as we arrived at the spot. On the ground immediately below the nest were the remains of an unidentified lizard and of grasshoppers. Insects and lizards are mentioned as food items by Brown *et al.* (1982). By the time of the next visit, later that month, the young had disappeared, probably taken by local youths.

The first rains in 1994 in the greater Niamey area occurred in late April, but the rainy season did not start in earnest until late May. Assuming an incubation time of 33 days, like that of the similarly sized Greater Kestrel *F. rupicoloides* (Brown *et al.* 1982), the first egg must have been laid just before 10 May. Breeding of this pair of Fox Kestrels therefore started around the beginning of the rainy season, in agreement with Brown *et al.* (1982) and Del Hoyo *et al.* (1994). The presence of young in June has also been noted in 1968 and 1969 in nests near Niamey and Dogondoutchi, both less than 100 km from the nest here described (P. Souvairan pers. comm.). In addition, we have observed Fox Kestrels, both singly and in pairs, moulting their primaries during July and August at a number of locations in the Dallol Bosso. Assuming that the primaries are moulted post-breeding, as they are in the Common Kestrel *F. tinnunculus* and the Lesser Kestrel *F. naumanni* (Cramp & Simmons 1980), the timing of the observed moulting also points to breeding during the early rainy season.

We note that there were four eggs, not the 2–3 mentioned in the literature. The pale buff colour of the downy young, not white as provisionally mentioned by Brown *et al.* (1982), is unlikely to have been due to dust in the rains. This dust is much redder (cf. Brouwer *et al.* 2000), and rain could not enter the nest hole. The young were only 1–2 days old when their down colour was noted. The downy young of the Greater Kestrel *F. rupicoloides*, arguably the closest relative of the Fox Kestrel (Brown *et al.* 1982), are also pale buff, while the young of the other kestrels in that taxonomic group, the Common Kestrel *F. tinnunculus* and the Lesser Kestrel *F. naumanni*, have white first down. These latter two species also show a clear adult sexual dimorphism which is absent from the Greater and Fox Kestrels. The Fox Kestrel and the Greater Kestrel may indeed be allospecies, quite similar in appearance, showing almost no overlap in their complementary distributions, and together covering almost all of semi-arid sub-Saharan Africa.

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Occurrence of the Cape Verde Shearwater *Calonectris edwardsii* on the Brazilian coast

*by Maria Virginia Petry, Leandro Bugoni &
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The Cape Verde Shearwater, *Calonectris edwardsii*, was described as a species by Oustalet (1883), and was later treated as a subspecies of Cory's Shearwater, *Calonectris diomedea*, although it was diagnosed as distinctly and easily separable from the latter. The phylogenetic analysis of the group, recently performed by Hazevoet (1995), indicates that the subspecies of *Calonectris diomedea* (*C. d. diomedea*, *C. d. borealis* and *C. d. edwardsii*) form an apparently paraphyletic group. For this reason Hazevoet considered valid the specific status given to the Cape Verde Shearwater. Since then, other authors have treated this biological form as a full species (e.g. Sibley 1996, Porter *et al.* 1997, Olmos & Martuscelli, in press).

Calonectris edwardsii is endemic to the Cape Verde Islands where it breeds in large colonies (Enticott & Tipling 1997), estimated at 10,000 breeding pairs (Hazevoet 1994). Information regarding its migration is scarce. It is, however, known that they are absent from the Cape Verde Islands during the non-breeding period (Cramp & Simons 1977). These authors suggest that the small number of individuals of *C. diomedea* which winter in western Africa could be *C. edwardsii*. Porter *et al.* (1997) also remark that the species probably disperses towards the South Atlantic.

Presumed immatures linger in the South Atlantic into the southern winter, and up to 20 birds/km were wrecked all down the east coast of Brazil (Lima 1994, Olmos *et*

al. 1995). Lima *et al.* (1997) mention finding a specimen of *C. edwardsii* on the northern coast of the state of Bahia, Brazil, in May and June 1996, and consider this to be the first reported for Brazil. On May 27-28, 1997, Olmos & Martuscelli (in press) observed two individuals at sea, close to the coast of the state of São Paulo (24°47'S, 44°32'W and 24°07'S, 43°48'W), following a fishing boat, associated with *C. diomedea* and other pelagic birds. Here, we present reports of *C. edwardsii* collected dead on the beaches of the south Brazilian coast.

In 1997 and 1998, monitoring was performed 13 times a month along 3,000 km of the coast of Rio Grande do Sul, Brazil. During the monitoring, all birds found dead were identified, measured, and the cause of death assessed. On 20 May 1998, three specimens of *C. edwardsii* were found between co-ordinates 30°25'S, 50°17'W and 30°52'S, 50°36'W. It proved impossible to determine the sex, because they were probably young individuals whose viscera were in an initial state of decomposition. The skeletons and skins were deposited in the scientific collection of higher vertebrates, at the Zoology Museum of the Universidade do Vale do Rio dos Sinos (numbers 563, 586 and 587). The biometric data collected (Table 1) agree with those given by Cramp & Simmons (1997) for *C. edwardsii*. These values are considerably smaller than those given by the same authors for *C. d. borealis* and *C. d. diomedea*, and also lower than those obtained by our team for *C. d. borealis* (Table 1, M. V. Petry, unpublished data). Cramp & Simmons (1997) state that *C. edwardsii* is approximately 10-15% smaller than *C. diomedea*. We observed that the characteristics which distinguish this species from *C. diomedea* are: shorter, dark bill, with a subterminal black band instead of large yellow bill of the Cory's; darker head and dorsum; relatively longer tail; general aspect smaller and slimmer than Cory's Shearwater. These characteristics are also referred to by other authors (Cramp & Simmons 1977, Harrison 1983, 1987, Enticott & Tipling 1997, Porter *et al.*, 1997).

TABLE 1

Measurements (mm) of three specimens of *Calonectris edwardsii* collected on the coast of Rio Grande do Sul State (data from deposited material on the UNISINOS Zoology Museum), and means of 164 specimens of *Calonectris diomedea borealis* collected on the coast of Rio Grande do Sul State

N.º of collection	Total length	Wing	Bill	Tail	Tarsus
<i>C. edwardsii</i>					
563	470	315	43.8	130	47.6
586	475	310	43.3	125	48.6
587	480	—	42.27	—	47.4
<i>C. d. diomedea</i>					
Means	526.9	349.9	54.3	133.1	

The data presented in this study represent the southernmost records of the distribution of *C. edwardsii* and, together with the recent observations in Brazil,

corroborate the hypothesis suggested by Porter *et al.* (1997) regarding the dispersion of the species toward the South Atlantic.

Aknowledgements

We would like to thank UNISINOS/UNESCO, which supported our research, Juan M. Barnett who provided some references for the identification of the birds, Fábio Olmos for his comments, and Walter Adolfo Voss for reading the text.

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MEMBERSHIP

Under the current rules, only Members of the British Ornithologists' Union are eligible to join the Club, and to receive (postage free) four quarterly issues of the *Bulletin*, and the annual index, for an annual subscription of £12 (or U.S. \$26). Applications, enclosing the annual subscription, should be made to the Hon. Secretary (address as below). These Rules are currently being revised to widen Membership to include non-Members of the Union – see notice on page 137. Details are shown in the leaflet enclosed with this issue for approval at a Special General Meeting called for that purpose, on Tuesday 31st October 2000.

The 2000 List of Members is now available free of charge to all requesting a copy, on application to the Hon. Secretary (address below). This list includes E-mail addresses, where known, and Members are requested to inform the Hon. Secretary of all corrections or changes, without delay, for despatch of the *Bulletin*. To offset the cost of postage, any contribution, or a stamped and addressed envelope (A5), would be gratefully accepted.

UK Data Protection Act. In order to keep records up to date, and to facilitate despatch of the *Bulletin*, names and addresses of Members and Subscribers, and the dates of subscription renewal (but no other personal information), are held on computer disk. If there is any objection to this, please advise the Hon. Secretary, in writing, so that these records can be **deleted from the disk**.

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CORRESPONDENCE

Correspondence on membership, subscription renewers, changes of address and all related matters should be addressed to the Hon. Secretary, Cdr. M. B. Casement OBE, RN, Dene Cottage, West Harting, Petersfield, Hants GU31 5PA, UK (or Email: mbcasement@aol.com). For details of Club Meetings, see inside front cover.

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INSTRUCTIONS FOR AUTHORS

Authors are invited to submit papers on topics relating to the broad themes of taxonomy and distribution of birds. Descriptions of new species of birds are especially welcome and may be accompanied by colour photographs or paintings. On submission, **two copies** of manuscripts, typed on one side of the paper, **double spaced** and with **wide margins**, should be sent to the Editor, Prof. Chris Feare, 2 North View Cottages, Grayswood Common, Haslemere, Surrey GU27 2DN, UK. **Note that electronic versions are not required on first submission.** All contributions should follow the style of papers in this issue, and where appropriate may include half-tone photographs.

When papers are accepted, revisions should be returned to the Editor in the form of both a **hard copy** as outlined above, and also on a 3.5" disk, as **Word or Wordperfect files** for PC.

Authors are entitled to 10 free offprints (16 if 2 or more authors) of the pages in which papers appear. Additional offprints may be ordered when proofs are returned. Authors may be charged for proof corrections for which they are responsible.

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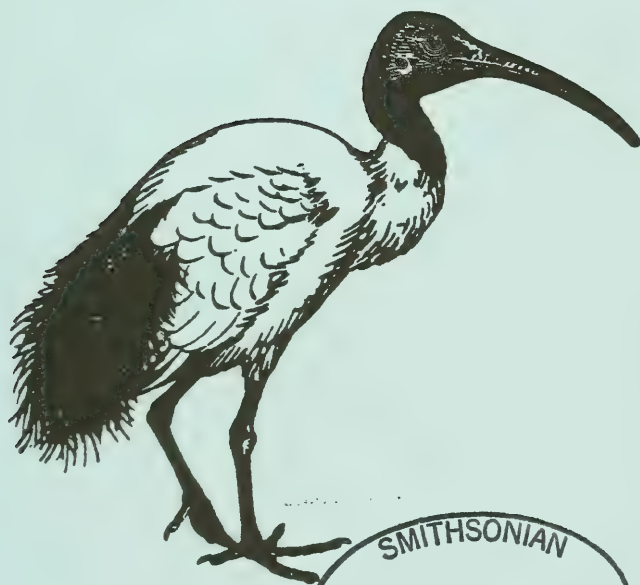
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Bulletin of the British Ornithologists' Club



MEETINGS are held in the **Sherfield Building of Imperial College**, South Kensington, London, SW7. The nearest Tube station is at South Kensington; a map of the area will be sent to members, on request. (Limited car parking facilities can be reserved, on prior application to the Hon. Secretary). The cash bar is open from **6.15 pm**, and a buffet supper, of two courses followed by coffee, is served at **7.00 pm**. (A vegetarian menu can be arranged if ordered at the time of booking). Dinner charges were increased to **£17.00**, as from **3 October 2000**. Informal talks are given on completion, commencing at about 8.00 pm.

FORTHCOMING MEETINGS

16 January 2001 - Frank D. Steinheimer "*Undiscovered Cambodia - the endemics of the Cardamom Mountains*." Frank was born in 1971 in Nuremberg, Germany, and studied zoology at Vienna University 1994-98, during which time he made field trips to foreign countries (Europe, Borneo, Thailand, Malaysia). He also gained experience working for the Bird Department of the Vienna Museum, also in Paris Museum. Since September 1998, Frank has been employed in the Bird Group of The Natural History Museum, Tring, working mainly with the wet anatomical and historically important collections (e.g. Darwin). In spring 2000 he took part in an expedition to west Cambodia.

Applications to the Hon. Secretary by 2 January please.

6 March - Dr T.M. Brooks - "*Deforestation and bird extinctions in the Philippines*". Tom now lives in Washington DC, USA, but was born in 1972, in Brighton, England. After reading geography at Cambridge 1990-93 he obtained his PhD in Ecology at University of Tennessee, Knoxville, USA, with his dissertation on "Predicting Bird Extinctions following Tropical Deforestation". He has extensive field experience in Kenya and seven other African countries, the Philippines, Indonesia, Paraguay and Florida. Author of over 70 publications in international journals covering biodiversity and conservation subjects, he is currently working on a "Continent-wide Blueprint for Conservation in Africa". Tom is Director, Biodiversity Analysis, Center for Applied Biodiversity Science, Conservation International Washington DC, USA; also Assistant Research Professor, Universities of Copenhagen, Denmark and Cambridge, UK.

Applications to the Hon. Secretary by 20 February please.

3 April - 900th Meeting.

Robert McCracken Peck - "*John James Audubon in the American West: The Last Expedition*". Mr Bob Peck, a Fellow of the Academy of Natural Sciences of Philadelphia, is a distinguished historian and naturalist, the author of the the BBC book "*Land of the Eagle: A Natural History of North America*", and a consulting curator for the exhibition "*Audubon in the West*" now touring the USA. Using slides of Audubon's western paintings and artefacts gathered during his expedition in 1843, Bob will describe Audubon's last great adventure and put its accomplishments into the broader context of its time. A fully illustrated catalogue, with essays by Mr Peck and others, accompanies the exhibition, and will be available for purchase at this meeting.

Applications to the Hon. Secretary by 20 March please.

Future meetings - Advance dates for 2001. Tuesdays:

1 May - AGM and social evening

3 July - Dr A.F.A. Hawkins - (*Madagascar* - precise title not yet finalised)

25 September, 6 November, and 4 December - speakers not yet finalised.

Overseas Members visiting Britain are especially welcome at these meetings, and the Hon. Secretary would be very pleased to hear from anyone who can offer to talk to the Club, giving as much advance notice as possible - please contact: Michael Casement, Dene Cottage, West Harting, Petersfield, Hants. GU31 5PA. UK. Tel/FAX:01730-825280 (or Email: mbcasement@aol.com).

Bulletin of the BRITISH ORNITHOLOGISTS' CLUB

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STOP PRESS

A **Special General Meeting** took place at 6.30 pm on Tuesday 31 October, at Imperial College, attended by 25 Members. The Special Resolution to adopt the new Rules of the Club, as proposed in the draft dated 4 July 2000, and circulated to all Members as an insert to *Bulletin* 120 (3), was approved, with two minor amendments. The approved text will be published, in full, at the next opportunity.

Details of the new subscription rates for 2001 are shown on the inside cover of this issue, and subscription reminder leaflets are also enclosed.

CLUB NOTES

The 894th meeting of the Club was held on Tuesday 4 July 2000, at 6.15 pm. 26 Members and 6 guests attended.

Members present were: Dr R.P. PRŶS-JONES, (*Chairman*), Miss H. BAKER, Sir David BANNERMAN Bt., I.R. BISHOP, D.R. CALDER, Dr. M.J. CARSWELL, Cdr M.B. CASEMENT RN, Dr. R.J. CHANDLER, S.J. FARNSWORTH, D.J. FISHER, Dr. L.D.C. FISHPOOL, A. GIBBS, D. GRIFFIN, C.A.R. HELM, J.A. JOBLING, Dr C.F. MANN, D.J. MONTIER, R.G. MORGAN, Mrs M.N. MULLER, Dr. D.E. POMEROY, R.C. PRICE, N.J. REDMAN, R.E. SCOTT, P.J. SELLAR, F.S. STEINHEIMER, and N.H.F. STONE.

Guests attending were: Lady P. BANNERMAN, Ms G. BONHAM, Mrs J.B. CALDER, Mrs M. MONTIER, Dr. P.C. RASMUSSEN and M. WALTON.

After dinner, Dr Lincoln Fishpool gave a talk, illustrated with slides, about BirdLife International's Important Bird Areas (IBA) in Africa programme, of which he is the co-ordinator. He described the principles of the IBA process, a sites-based approach to bird conservation, and the history of the programme, which originated in Europe and was followed by a similar programme in the Middle East. The initiative was then extended to Africa in 1993, and the four criteria that have there been used to select IBAs were explained. These involve the presence of species of global conservation concern, of species of restricted-range (i.e. of Endemic Bird Areas), of groups of species whose distributions are confined to particular biomes and of the globally important concentrations of waterbirds, seabirds or terrestrial species. He showed a map giving the location of the 1,250 or so IBAs in Africa and associated islands that have been identified to date, and described the processes by which the national IBA inventories have been compiled. A continental directory, documenting all these sites, is scheduled for publication next year.

In those countries where the BirdLife Partnership is not represented, ornithological contacts were otherwise lacking, or where current political conflict leaves no alternative, IBAs have been identified by individuals, often expatriate experts on the country by synthesising existing, frequently old or partial, data. For a good number of others, however, site selection has been by national ornithological societies and conservation organisations and individuals, many of them BirdLife Partners or Representatives. This has been done over the past 7 years in collaboration with and, as appropriate, with support from, other BirdLife Partners such as the RSPB and the international donor community. Dr Fishpool described the workshops, field surveys, data

compilation and training in bird identification and survey techniques required to draw up the national IBA networks and showed examples of the sort of outputs that have been produced, including posters and national IBA publications.

The speaker concluded by outlining the next steps in the process, moving from site identification to conservation action at IBAs. He introduced briefly the 10 country, GEF-UNDP funded programme that is seeking to promote the conservation of IBAs by advocating their inclusion, as necessary, into national protected area networks and by working with site-adjacent communities at high priority sites. The establishment of Site Support Groups at and for individual IBAs (currently numbering 21 in 5 countries) is seen as a positive step towards the lasting conservation of such sites. The meeting ended after a stimulating period of questions and discussion.

The 895th meeting of the Club was held on Tuesday 3 October 2000, at 6.15 pm. 24 Members and 10 guests attended.

Members present were: The Rev. T.W. GLADWIN (*Chairman*), Miss H. BAKER, P.J. BELMAN, I.R. BISHOP, Dr W.R.P. BOURNE, Cdr M.B. CASEMENT RN, Professor R.A. CHEKE, Professor C.J. FEARE, F.M. GAUNTLETT, D. GRIFFIN, C.A.R. HELM, Dr J.P. HUME (*Speaker*), J.A. JOBLING, Dr C.F. MANN, D.J. MONTIER, R.G. MORGAN, Mrs M.N. MULLER, A.J. PITTMAN Dr R.P. PRŶS-JONES, N.J. REDMAN, R.E. SCOTT, Dr D.H. THOMAS, N.H.F. STONE and C. WALKER.

Guests attending were: Ms G. BONHAM, Mrs C.R. CASEMENT, Dr A.S. CHEKE, Dr J. COOPER, Mrs M.H. GAUNTLETT, Mrs J.M. GLADWIN, Ms A. KESSEN, Mrs M. MONTIER, Ms R. QAIYOOM, and Professor P. RAINBOW.

The Chairman called for a minute's silence in memory of Peter Hogg, a Member since 1957, who died in June, with grateful thanks for his service to the Club on the Committee (1962-66, and 1972-74), *Vice-Chairman* 1974-77 and *Chairman* 1977-80.

After dinner, Julian Hume gave a talk, illustrated with many slides of his own paintings, entitled "*A window into the past - the diversity of fossil records on islands*". The following is a brief synopsis:

Oceanic islands are unique microenvironments of evolution and provide excellent data sources for phylogenetic study. The speaker has studied two island groups: the Hawaiian and Mascarene Archipelagos. Both are volcanic in origin, neither have ever been connected to any continental land mass, each has a high degree of faunal endemism and, sadly, both have suffered catastrophic extinction rates due to anthropomorphic activity. Each archipelago has been colonised by a number of vertebrate species but different factors have beset their descendants. As a result, faunal composition has evolved under quite different circumstances. Bird colonists reached the Hawaiian Archipelago, either windblown or as migrants, from east and west, but due to the large distances involved, comparatively few species survived the journey. However, for those that were successful, a group of topographically and ecologically distinct islands were available for colonisation.

The most important of these bird colonists, and one which epitomises adaptation from a single founder species, is that of the tribe *Drepanidini*, the Hawaiian finches, derived from a cardueline-like finch. The 30 or so historic species have a range of bill shapes and feeding niches that encompass almost all of the passerine adaptations. However, the discovery of fossil species not only increased by an order of magnitude the number of Hawaiian finches, but also indicated that other historically unknown Hawaiian bird orders, notably anseriforms (ducks and geese), strigiformes (owls), and ciconiiforms (ibises), had radiated as well.

The Mascarenes, comprising Mauritius, Réunion and Rodrigues, are situated in the southwestern Indian Ocean. Bird colonists have arrived almost exclusively from the Australasian region but, unlike the Hawaiian Islands, the founder species never radiated and they represented pulses of colonisation. This is probably linked to lower sea levels in the past, when present day small island groups and atolls would have been large islands, thus allowing species to "island hop" across

oceans. Some of these pulses are very ancient, culminating in extreme evolutionary processes, best exemplified by the Mauritian Dodo. Radiation has occurred in *Pteropus* fruit bats and reptiles, unlike in Hawaii where, save one small bat, no mammals or reptiles ever successfully colonised the islands.

Sadly, the fauna of both archipelagos has been severely depleted. The arrival of Polynesians in Hawaii around 400BC, and the arrival of western Man in 1778, saw the destruction of much of the lowland forest and extinctions of all but a few species. The historic period of the Mascarenes began with the arrival of the Dutch, in Mauritius, in 1598. Upon discovery, the fauna and flora was still relatively intact, but by the end of the next century the forests and most of the birds had gone.

Some indication of the former bird diversity on the Mascarenes can be gleaned from early accounts and contemporary illustrations, but on Hawaii no such accounts exist and the Polynesians left no written record. The full extent of diversity, speciation and adaptive radiation on these oceanic islands has, until recently, suffered bias towards the historic record. In fact, it has been the fossil record which has indicated species richness and provides a view into island ecologies that no longer exist – a “window into the past”.

The meeting concluded with a lively period of questions.

BOOKS RECEIVED

Fisher, M. Ghazanfar S.A. & Spalton, A. (Eds.). (1999) *The Natural History of Oman. A Festschrift for Michael Gallagher*. Backhuys Publishers, Pp 206, 31 figures, 18 tables, hardbound. ISBN 90-5782-050-1. Available from Backhuys Publishers, PO Box 321, 2300 AH Leiden, Netherlands Price: NLG 96 (excluding postage & handling).

This is an important record of the present status of threatened and endangered species in Oman. It covers not only birds, but the flora and terrestrial mammals, with separate chapters on Reptiles and Amphibians, Sea Turtles, the Arabian Tahr, and Arabian Leopard; and a review of Cetaceans from waters off the Arabian Peninsula.

Of special interest to ornithologists is Chapter 6, covering bird studies 1980-1999, contributed by Jens Eriksen. This summarises the achievements of the Oman Bird Records Committee (OBRC), and the publication of the *Breeding Bird Atlas of Oman* (Anon. 1998). Tribute is made to Mrs F.E. (“Effie”) Warr for her major pioneer work on this, from the late 1960s until August 1981.

This book has been published, with financial help from the British Council in Oman, as a tribute to Michael Gallagher for his major contribution to natural history throughout the past 30 years - from his first visits to Oman, on Army duty (1969-1973), and subsequently his work for the Diwan (1976-1981) and for the Ministry of National Heritage and Culture from 1982, until his retirement in 1998. He set up the Museum of the Natural History of Oman, which opened in 1985. His main ornithological achievement, *The Birds of Oman*, illustrated by Martin Woodcock, was published in 1980, and an updated edition in Arabic appeared in 1985.

Researchers and conservationists will find this book a mine of useful information, with a comprehensive index and extensive references. It also demonstrates the impressive range and scope of Michael's personal contribution to the natural history of Oman, with six pages listing the 115 articles and papers which Michael has authored, (some with others); also seven pages giving details of 30 new animal and plant taxa collected by, and named after him.

This is a remarkable book, and a worthy tribute to a remarkable naturalist.

M.B.Casement

Kennedy, R.S., Gonzales, P.C., Dickinson, E.C., Miranda, H.C.Jr. & Fisher, T.C. (2000) *A guide to the birds of the Philippines*. Oxford Univ. Press. Pp. 369, 72 colour plates. Hbk ISBN 0 19 854669 6, £60,

pbk ISBN 0 19 854668 8, £34.95.

The fascinating avifauna of the Philippines has waited a long time for a modern field guide. Robert Kennedy and his co-authors have made the wait well worthwhile. The book follows what has become a "norm" in field guide style, but the introduction contains a valuable and interesting section "Guidelines for accepting new records". This highlights the difficulties facing checklist/field guide authors, records committees, journal editors and referees etc. and should serve as a basis for all involved in record adjudication, especially in parts of the world that are poorly known in ornithological terms. Plates by 12 authors are generally excellent and accompanied by clear distribution maps, with status represented by different colours, and brief identification notes. Species accounts give Filipino names for some (but not all) species, status, fuller description, basic measurements, differences from similar species, habits (including habitats, behaviour and breeding season), voice (including location of tape-recordings) and range (including the ranges of different subspecies within the archipelago, although differences between subspecies are not described or illustrated). The bibliography is surprisingly brief, but the introduction emphasises that this book is in fact the final part of a trilogy that includes *Bibliography of Philippine Ornithology* (1985) and *The birds of the Philippines: an annotated check-list* (BOU), both co-authored by Kennedy and Dickinson, and both extensively referenced.

This guide covers 572 species, 172 of which are endemic, and many of which are spectacular. The authors have done a wonderful job in packing in so much information and the publishers have set it all in an uncluttered way. Essential for those with a serious interest in eastern Asian birds and a joy for the armchair browser.

Chris Feare

Kren, J. (2000) *Birds of the Czech Republic*. Christopher Helm/A & C Black. Pp.336, 44 black & white photos, 29 black & white illustrations. ISBN 0-7136-4784-1, £25.

With this first English guide to the birds of this country, now even foreigners will find their way around, especially as the species names are also given in Czech, Slovak and German (see below). Following the great Czech ornithological traditions of previous publications (K. Hudec 1983, 1994, K. Sedláček 1988, K. Štastný et al. 1987, 1996), Josef Kren lists all 396 recorded bird species of the covered area, 310 with detailed information, but all with distribution maps (divided into the 76 Czech counties). Some notes on population trends, distribution and seasons are given, while black-and-white drawings illustrate several species. The book lists also the Important Bird Areas of the country and other sites of particular interest, each with locality maps and species accounts; however, users should always have a good road map to understand the computer generated ones in the book. Prior to the species chapters some geographical and ecological information about the Czech Republic are given. The book finishes with complete check-lists to the birds of the Czech and Slovak Republic, a table of hunting seasons, lists of plant & place names, bibliography and indices.

The habitat photographs are too small and poor and the occurrence maps of the "accidentals" do not add anything to the general understanding of the avifauna; these should have made space for additional data given in more comprehensive earlier publications (see above). The inclusion of the former breeding Rock Thrush, Lesser Grey and Woodchat Shrike under the category "accidentals", while the Pallas's Sandgrouse and the Azure Tit are in the general species accounts, is inconsistent. Several spelling/typing mistakes are found throughout the book, unfortunately also in the German species names & references. The Czech/Slovak names are ignorantly written in English typeface, distorting for example the "*Xáp černý*" to an unrecognisable "*Cap cerný*".

Nevertheless, this new guide will be a useful tool for foreign birders to the Czech Republic.

Frank D. Steinheimer

The nest of the Rainbow Star-frontlet, *Coeligena iris*

by Fernando Ortiz-Crespo

Received 5 June 1999

On 16 April 1999 I visited a new visitor trail surrounding Laguna de Llaviuco (approx. 2°50'S, 74°08'W), a c. 16 ha Andean lake situated at the eastern foot of the Cajas Mountains at 3,100 m, and 17 road km northwest of Cuenca in southern Ecuador. Paul Turcotte, a resident of Cuenca informed me of a nest of an unidentified hummingbird he had found on the trail one week earlier.

The section of the trail where the nest was located resembled a "covered bridge", with a wooden frame supporting a walking surface of transverse poles shielded from the rain by a thatched roof. The fairly conspicuous nest was placed c. 70 cm below the roof and was attached to the only living branch found under it, since the vegetation had been trimmed when the trail was laid. As we approached, a hummingbird flew off the nest and perched some 25 m away, between the trail and the lake.

The nest was an open cup-like structure with a nearly circular rim 7.5 cm in diameter and with convex sides 6–8 cm high. The outer walls of the nest were built with green moss strands. The cavity, c. 4 cm deep, had two white eggs that rested on a dense, reddish brown lining. This material extended up to the nest rim, where it showed as a conspicuous dark ring against the bright green of the mossy walls. The nest was placed 2 m above the trail at the end of a living branch of an *Oreopanax avicennifolius* sapling, being anchored to the leafy tip of the branch which was woven into the base of the nest with moss strands. The lower edges of the walls were festooned with loose green moss filaments (Plate 1).

When the bird returned, it proved to be a Rainbow Star-frontlet, *Coeligena iris hesperus*, a species in which the sexes are nearly monomorphic. Not wishing to disturb it any longer, we walked away.

I have also examined a nest photographed (Plate 1B) and preserved by a local ornithologist, Fabián Rodas. This nest was collected at Llaviuco on 5 February 1998, and was almost identical to the one previously described (it reportedly had two eggs that broke after falling during heavy rain), except that it was conical and attached to a thin branch along the side. Its outer portion was made of woven moss filaments and the cavity was lined with a thick layer of brownish red plant hairs. A sample taken from this nest was analyzed at the Herbarium of Quito's Pontificia Universidad Católica by Hugo Navarrete, a fern specialist, who tentatively identified the brownish red material as *Lophosoria quadripinnata* var. *contracta* (Hieron.) R. & A. Tryon. Tryon & Stolze (1989: 108) state that the form *contracta* is restricted to the subparamo of southern Ecuador and northern Peru.

Two points are worth emphasizing regarding the nest lining. The first is that fern trichomes consist of the walls of dead cylindrical cells, growing in uniseriate columns,

and thus amount to minute, chambered hollow tubes which presumably provide efficient thermal insulation. The second is that the colour of the trichomes resembles that of the reddish wing and tail feathers of this form of Star-frontlet, so that an individual sitting on eggs or nestlings might appear more cryptic to diurnal predators.

Unlike most hummingbird nests described in the literature, the walls and anchorage of these nests were not held together or braced with cobwebs. Perhaps moist moss strands are sufficiently pliable to be woven into a stable and elastic structure. If so, rainy weather might be favoured for nesting since moisture would tend to favour the seasonal growth of epiphytic and ground mosses. April and May are the wettest months of the year at Llaviuco. Therefore, if this record is typical, this hummingbird may indeed breed in the wetter months of the year, unlike trochilids in inter-Andean northern Ecuador that nest in October–January, prior to the main rainy season. Fjeldså & Krabbe (1990: 266) state that the Rainbow Star-frontlet breeds "November–January", but these authors provide no further details nor references to published descriptions of nesting by any species of *Coeligena*. However, neither of them recalled that a published account exists for the nest of this or any other Star-frontlet (Fjeldså & Krabbe, pers. comm., 1999). A brief description in a local field guide states that "[two nests of this species] were built of green moss on the outside and had an inner lining of brown vegetable fibres, being shaped as open cups 8–10 cm high, 6–8 cm wide in the outside and 1.5–3 cm deep" (Toral 1996: 42; my translation).

Laguna de Llaviuco, known locally as Surocucho, is the hub of the 1,500 ha reserve owned and managed by Cuenca's potable water company, ETAPA. The lake is surrounded by Andean forest remnants, pastures and paramo areas that merge with the larger Cajas Reserve. The Andean forest here is made up of an array of trees and tall shrubs (*Prumnopitys montana*, *Ocotea heterochroma*, *Oreopanax* spp., *Hedyosmum* spp., *Weinmannia fagaroides*, *Vallea stipularis*, *Oreocallis grandiflora*, *Miconia pustulata*), smaller shrubby plants (*Macleania rupestris*, *Gaultheria* spp., *Salvia hirta*, *S. corrugata*, *Fuchsia loxensis*) and orchids and epiphytic and terrestrial bromeliads, with emergent *Scirpus californicus* reed stands near the lake's edges. Mosses carpet the forest floor and the trunks of the larger shrubs and trees, and ferns are common in the understorey. An open, flat marsh lies to the west of the lake. Introduced eucalyptus *Eucalyptus globulus* and Monterey cypresses *Cupressus macrocarpa* grow on the slopes. At the time of our visit the most profusely flowered nectar source was *Fuchsia loxensis*, but we did not see the nesting hummingbird feed there. However, these hummingbirds have been recorded visiting the flowers of this plant (Rio Mazan Reserve Management Plan, King 1989), and those of the Proteaceous shrub *Oreocalyx grandiflorum* (pers. obs.).

This trochilid is an Andean endemic, with the subspecies *hesperus* restricted to the Cuenca basin and neighbouring areas from southernmost Cañar province just northeast of Cuenca (Hacienda La Libertad, c.2°32'S, 78°40'W, R. S. Ridgely's letter to S. White, 1991) to a few km south of Cuenca, being replaced further south by the nominate race in Loja province in extreme southern Ecuador, and by the races *aurora*, *hypocrita* and other doubtfully valid ones in northern Peru (Peters 1968: 102–103).

A



B



Plate 1. A. Active nest of *Coeligena iris hesperus*, Llaviuco, 16 April 1999. Photo by Paul Turcotte. B. A nest of *Coeligena iris hesperus* collected at Llaviuco on 5 February 1998 and later preserved. Photo by Fabián Rodas.

No other *Coeligena* species is found in Llaviuco, but further south the Rainbow and the Buff-winged Star-frontlet *Coeligena lutetiae* seem to replace each other altitudinally, the latter being found at higher elevations (Bloch *et al.* 1991: 103). Peters's habitat description for *C. i. hesperus*, "arid temperate zone", seems misleading since the Llaviuco area gets well over 1,000 mm of rain per year (P. Turcotte, pers. comm.). In my experience this Star-frontlet, like its congeners, is never found away from moist areas with a cover of native trees or shrubs. It is certainly not found within the Cuenca city limits nor in the hills surrounding that city, where it is drier and native vegetation has been largely replaced with exotic plants. Parker *et al.* (1982: 46) state that this Star-frontlet occurs in "humid subtropical and temperate" habitats in northern Peru, which seems a more typical situation.

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Observations on Henderson's Ground Jay *Podoces hendersoni* in Xinjiang, China

by Tiziano Londei

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The ground jays, *Podoces*, comprise four species of unusual, terrestrial corvids which inhabit semi-desert regions of Central Asia. Although Henderson's Ground Jay *Podoces hendersoni* has been frequently reported from Mongolia (Stephan 1994), knowledge of its biology is fragmentary. During two weeks of travelling in northern and central Xinjiang (13-25 August 1998), I saw the species on seven occasions and obtained information on its distribution, habitat and behaviour in that region.

Distribution

Locations and approximate altitudes of birds located were obtained using a GPS instrument and an atmospheric-pressure based altimeter (Table 1).

Sites 1 to 6 are in the Junggar Basin. Previously, only Przhevalskii (Deditius 1886) found Henderson's Ground Jay in the Junggar Basin proper, in the desert near Ulungur Lake and Ulungur River, April-May 1879. Eastwards, the habitat may continue to the desert in Hami prefecture, where several explorers found this species: Przhevalskii, the Grum-Grzimaïlo brothers (Pleske 1892), Carruthers (Ludlow & Kinnear 1933), and Beick (Stresemann *et al.* 1937). Sites 1 to 3 may be seen as a

TABLE 1.
Locations of observations of Henderson's Ground Jays

Site	Date (1998)	Local time (GMT+6h)	Co-ordinates Altitude (m)	Birds, their location and environment
1	14 August	1115	44°50'N, 90°00'E 700	2 adults, depression in pebble desert with scarce low bushes
2	14 August	1200	45°00'N, 90°03'E 1,100	1 adult, vehicle track in gully of pebble-rock desert with dense bushes on bottom of gully
3	14 August	1245	45°14'N, 90°08'E 1,300	Calls, hill top with low bushes in sandstone desert
4	19 August	1015	46°20'N, 85°55'E 700	1 adult, on asphalt road between pebble hillocks with low bushes
5	19 August	1045	46°15'N, 85°53'E 600	1 adult, margin of asphalt road with habitat as in site 4
6	19 August	1140	46°08'N, 85°45'E 400	1 adult, on clay-rock 0.5 km from vegetation (thickets on a sandy plain)
7	22 August	1340	42°14'N, 83°14'E 1,800	1 adult, margin of asphalt road in wide valley with low bushes on clay soil with pebbles

south-east extension of Przhevalskii's area, whereas Sites 4 to 6 are on the opposite side of the basin, in the desert between the eastern Tarbagatai Mountains and Lake Manas. On a recently published map (Cheng 1987), only two recording points fall in the Junggar Basin: a little south of Lake Manas and near Ürümqi.

Within the Tarim Basin I found Henderson's Ground Jay at only one location, Site 7, despite travelling through seemingly suitable habitat for c. 200 km (along the road from Bayanbulak to Kuqa, from Kuqa to Kezir Buddha Caves and Subashi, from Kuqa to Korla, and from Korla to Ürümqi via Toksun, at altitudes between approximately 1,100 and 1,300 m). In the past, Henderson's Ground Jay was frequently found in the northern piedmont zone of the Tarim Basin. Apart for a July record at "Opal, near Kashgar" (references in Hellmayr 1929 and Ludlow & Kinnear 1933), however, these records were not in summer. Grimmett & Taylor (1992) also failed to find them here in June and July. There are August records from the southern rim, between Karakax and Yarkant Rivers (Scully 1876), but these are from sites above 1,800 m.

Although any recent failure to find Henderson's Ground Jay may be due to more or less obvious habitat degradation (see below), these observations could also be explained by altitudinal migration. The ground jays are usually considered to be resident birds, but small-scale movements in response to food availability and weather have been postulated for Pander's Ground Jay *Podoces panderi* (Dementiev & Gladkov 1954), and this seems a likely phenomenon for birds that have to cope with some of the most extreme climates on earth. In Xinjiang, Henderson's Ground jay might thus be found all year at low altitudes in the relatively cool Junggar Basin, whereas the birds inhabiting the hotter plains of the Tarim Basin might move to higher altitudes in summer.

Habitat

Although Henderson's Ground Jay occupies a large geographical range and thus does not seem to be generally threatened (Madge & Burn 1994), large-scale programmes for desert cultivation in both the Junggar and Tarim Basins suggest a less optimistic outlook for a substantial part of the range of this species.

All my observation sites, except Site 6, were characterised by the presence of many pebbles in the soil and of some bushes, a habitat frequently reported for Henderson's Ground Jay. Site 6 differed in being within an extensive "yardang" zone, i. e. a zone of bizarre clay-rock formations produced by alternate water and wind erosion, with negligible vegetation. In this site I failed to find either the insects (Orthoptera) or lizards (*Phrynocephalus* sp.) frequently seen elsewhere. The nearest apparently habitable zone (presumably with sufficient food supplies) was a semi-desert with scattered bushes on purely sandy soil, 0.5 km away.

Sand is usually considered a marginal habitat for Henderson's Ground Jay, but without much reason: although Ludlow judged from his records that the sands of the Tarim Basin were more typical habitat for Biddulph's Ground Jay *Podoces biddulphi*

(Ludlow & Kinnear 1933), Henderson & Hume (1873), Scully (1876), and Divnogorskii (in Dementiev & Gladkov 1954), all recorded Henderson's Ground Jay on sand dunes in that region. Greater specialisation of Biddulph's Ground Jay for sandy soils has also been suggested by its longer and more slender bill. Given the observed occurrence of Henderson's Ground Jay, too, on sandy soils and the presence of Biddulph's Ground Jay in more vegetated desert (see Grimmett 1991 for a recent record), which depends on periodical flooding, habitat discrimination between these species may not be based on the amount of sand itself, but on the amount of periodically flooded areas. Here Biddulph's Ground Jay might use its bill for probing in the mud. I observed mud probing in the related Hume's Groundpecker *Pseudopodoces humilis*, using a hoopoe-like technique (Londei 1998) that would suit the bill of Biddulph's Ground Jay more than of Henderson's. The bottom of the Tarim Basin, where Biddulph's Ground Jay is endemic and Henderson's is absent, probably experiences more flooding than any part of Henderson's range. The stouter bill of Henderson's Ground Jay may be a more useful tool to dispatch coriaceous animals of arid biotopes (see below).

Behaviour

The occurrence of Henderson's Ground Jay near, or even on, roads (Table 1; Sites 2, 4, 5, and 7) is consistent with the previously observed, and probably ancient, habit of this and other ground jays searching for food along caravan paths.

Prolonged observations of behaviour were possible only at Sites 1 and 6. At Site 1, the first bird appeared half an hour after the (only) tourist group arrived. The bird's presence was first revealed by its melodious trills, best rendered as "churchuri", a Turkmen name for Pander's Ground Jay (Dementiev & Gladkov 1954). Shortly afterwards a second bird appeared, and both kept moving on the ground around the picnicking tourists. Although keeping at a distance of 20-30 m, they seemed reluctant to leave even when approached by a human. They ran with their bills open, as if panting, but closed them at each stop. Running birds were remarkably cryptic: on the folded wing the black and white wing patch was invisible, and the black on the crown and tail were inconspicuous. Given the weak flight of Henderson's Ground Jay and scarcity of cover in its typical habitat, passing unnoticed may be its only protection from attacks by raptors. The birds I was observing visited the base of bushes and every now and then caught an orthopteran, which was mashed by holding it in the bill while the bill was being moved as a sabre against the ground, and then the insect was swallowed. However, they kept close to the tourist group despite the vast uniform land all around, and seemed to be waiting for food items dropped by humans, to which they might be accustomed (Site 1 is a renowned place for visitors to see fossilised trees and is a traditional picnic site).

In Site 6 the single bird, first noticed on a "yardang" hillock, descended to a picnic place containing water-melon remnants and ate something from them, probably the seeds. Although this bird maintained a greater distance from humans than those at Site 1, it seemed likewise reluctant to leave the area when approached. Like other

corvids, ground jays can become bold, though wary, commensals of man: undisturbed Pleske's Ground Jays *Podoces pleskei* can even be fed by hand (Hamedanian 1997). The possible tameness of ground jays and their presence in increasingly accessible areas should enhance the study of these little known birds.

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A review of the status, distribution and habitat of Baumann's Greenbul *Phyllastrephus baumanni*

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Of the African Pycnonotidae, Baumann's Greenbul *Phyllastrephus baumanni* is one of the poorest known and least recorded. Despite the fact that its range extends in a belt of over 2,000 km, from northwestern Sierra Leone to southeastern Nigeria, there are few specimens in collections and the species is rarely mentioned or depicted in the literature. This lack of information, coupled with the bird's rather nondescript appearance (a medium-sized bulbul, brown above, grey below, with a rufous tail and few other distinguishing characters) and a large number of potential confusion species (Plate 1), has made identification of the species in the field difficult. This paper is an attempt to bring together what is known of its distribution and habitat preferences. I also hope that by focussing attention on the species in this way, it might provoke the generation of new data which will determine whether its conservation status, adjudged to be Near-Threatened by Collar *et al.* (1994), is justified.

Phyllastrephus baumanni was described by Reichenow (1895) from a specimen taken at Misahöhe, Togo. Since then it has, as far as I can determine, been collected from another 16 localities, three in Sierra Leone, three in Liberia, one in Côte d'Ivoire, two in Ghana, two more in Togo and five in Nigeria. I have found published records of field observations of the species from a further 20 or so sites. These are mapped in Fig. 1 and listed in Tables 1 and 2. Fewer than 40 records across six countries in over 100 years implies that the species is genuinely rare. Indeed, it has been more rarely seen than the number of these records imply since several of them are shown here to be based upon misidentifications while others remain inconclusive but are considered doubtful. These are also the reasons why a number of misconceptions and inaccuracies about the species have entered the literature.

Phyllastrephus baumanni is here treated as monotypic. The Toro Olive Greenbul, *Phyllastrephus hypochloris* has sometimes been considered (White 1962, Hall & Moreau 1970) to be a subspecies of *P. baumanni* but this has not found widespread support, for the reasons given by Zimmerman (1972). There is one synonym: *Phyllastrephus eburneus* Bannerman 1923. Full descriptions of *P. baumanni* are given by Bannerman (1936) and Keith (1992) while notes on the field identification and illustrations of the species are provided by Fishpool *et al.* (1994) and Fishpool (1999).

Details of all specimens that I have been able to trace and know or believe to be genuine are shown in Table 1. Ecological data on skin labels and contained in papers detailing the collection of these specimens are summarised below, country by country, together with, where appropriate, additional information from maps on altitude and topography of the collecting localities. Other published records of *P. baumanni*, based



Plate 1. Baumann's Greenbul *Phyllastrephus baumanni* (second from bottom) and species with which it has been confused: Slender-billed Greenbul *Andropadus gracilirostris* (top), White-throated Greenbul *Phyllastrephus albigularis* (second from top) and Brown Illadopsis *Illadopsis fulvescens iboensis* (bottom). Original artwork by Nik Borrow.

upon field observations only, are then detailed and assessed in light of this information and other evidence.

Specimen record information (see Table 1)

Nigeria

Five specimens - five localities. The specimen from Ede was collected "near the ground in thick foliage in second-growth" in country which generally "has the appearance of the northern savannas rather than of the forested south. The surviving forest, usually secondary in character, is restricted in the main to river banks" (Serle 1950). The Enugu specimen was "one of two in a small wood in the savanna" (Serle 1957). Marchant (1953) states of the Awgu skin that it "...is my only record, in very thick shrubberies at the edge of a thin strip of high bush flanking a stream in the orchard-bush country on the Awgu plain." Elsewhere in the paper Marchant describes "high bush" as "those patches of tall trees or thick woods which still remain here and there within the forest belt; may now be narrow strips along stream courses." Enugu and Awgu are both located near the base of the scarp slope of the Udi Hills which rise to over 500 m a.s.l. There is no information in Bannerman's (1921) account of the Iju Waterworks. Lagos to indicate in what habitat Lowe collected his specimen (where it is referred to as "*Phyllastrephus* (species uncertain)", its identity later being provided by Bannerman (1923)); the label states merely that it was shot in dense bush. Details of the Ibadan specimen are given in the next section.

Togo

Six specimens - three localities; no relevant published information. All three localities lie between 600 and 700 m a.s.l.; the terrain at Misahöhe consists of steep-sided forest-clad hills (R. A. Cheke *in litt.* 1998).

Ghana

Two specimens - two localities. Of his specimen from Ejura Lowe (1937) writes that "it is a shy bird, frequenting thick bushes, and so is no doubt easily overlooked." In the introduction of this paper he says of Ejura that "...the comfortable guest-house was situated near the escarpment, which is a dividing line between the forest and savannah country." However, it is possible that the specimen may have been collected a short way south of Ejura, for elsewhere in the paper he states: "...we could vary our ground by going to the Afram River, where a gallery forest existed, and so could get forest birds too. It was only a small stream at this spot.... The undergrowth was very thick, and the ground covered with *Costus*, a wild ginger, whose large leaves make excellent cover for birds that never intend to be seen."

Label data of the Mt Kyabobo specimen indicate that it was collected at an altitude of 610 m and "was netted in 4 ha patch of submontane forest isolated by woodland and cultivation". Moyer (*in litt.* 1998) has confirmed this, adding that "the general

habitat of the area consisted of a mosaic of Guinea woodland on the ridges and forest and thicket in a few of the valleys. Most forest patches were tiny, no more than 10 to 30 ha. The place where I netted the greenbul was a forest patch of about 4 ha on the upper side of a valley. The valley bottom was covered in a maize field and the ridge was woodland."

Côte d'Ivoire

Three specimens - one locality. Lowe, in Bannerman & Lowe (1923), states that around Béoumi "the country is open, with low rolling hills, well watered and covered at this time of year with tall grass, above one's head, whilst trees and bush are scattered in clumps everywhere....such birds as existed were chiefly in the 'bush'. Now the 'bush' here was more difficult to work in than anything I had experienced. ... sometimes one could crawl in with great difficulty on hands and knees but it was not possible to go far, for the tangle of thorns and unbreakable network of vines of varying size which held one fast."

Liberia

Twelve specimens - three localities. Of these, 10 (5 males 4 females 1 indet.) were collected on Mt Nimba (Colston & Curry-Lindahl 1986). Eight specimens are in The Natural History Museum, Tring (BMNH), the other two were presumably among the 150 skins left at the Nimba Research Laboratory, Grassfield, Nimba and lost or destroyed in 1981 "when the laboratory was ransacked". Of the eight in BMNH, label data of six indicate they were collected between 1,000 and 1,300 m a.s.l. on the "mine road" and "mine area", one was taken at 500 m on the "mine road" and one at 550 m at Grassfield. In the description of the vegetation of the mountain Colston & Curry-Lindahl (1986) state that between 500/600 and 1,200 m the predominant habitat consists of "slope and ridge rain forests", with "slope forests...a type...transitional between lowland and montane rain forest' while 'at about 900 m contour there is an important ecological boundary line. From here upwards a dense layer of clouds and mists usually cover the upper slopes and summits except during the dry months.*Parinari excelsa* dominates..." while along the summit at 1,000 - 1,200 m "is the ridge forest" where *Parinari* often occurred as pure stands.

The region whence the Ganta specimen was collected is described by Rand (1951) as follows: "...the St John river and several smaller streams drain the area, most of which is farmed, although there are vast stretches of thick second growth of varying ages. Except for occasional 'islands' much of the original primary forest lies in remote spots. One such area lies ten miles east of Ganta, where a range of rugged hills covered with a belt of primary forest several miles wide cuts across the country for some twenty miles." These hills rise to over 500 m a.s.l.

Finally, of the specimen from Paiata it is only stated that 'like others of this group it is probably a bird of thick growth, seldom seen' (Allen 1930). Elsewhere in the work Paiata is described as being "85 miles from the coast on the St Paul's river, 740 ft a.s.l." (c.250 m).

TABLE 1.
Specimens records of *Phyllastrephus baumanni*

Country	Locality	Map No.	Locality reference (Fig. 1)	Collector	Date	Specimens	Depository	Reference
Nigeria	Iju Water works, Lagos	1	06°20'N, 03°35'E	WP Lowe	12.II.20	1♂	BMNH Tring [specimen number 1920.3.10.36]	Bannerman (1921)
	Ede	2	07°40'N, 04°30'E	W Serle	13.XI.43	1♂?	BMNH Tring [specimen number 1966.16.1441]	Serle (1950)
	nr Awgu, Onitsha Prov.	3	06°05'N, 07°28'E	S Marchant	14.XII.47	1♀?	BMNH Tring [specimen number 1948.22.33]	Marchant (1953)
	Enugu	4	06°25'N, 07°30'E	W Serle	30.VIII.54	1♂	BMNH Tring [specimen number 1966.16.1442]	Serle (1957)
	Ibadan, University College	5	07°22'N, 03°54'E	FC Sibley	5.XI.60	1♂	LSU Baton Rouge [accession number 247]	Elgood & Sibley (1964)
Togo	Misahöhe	6	06°57'N, 00°35'E	E Baumann	13.II.1895	1♂	MFN Berlin [type, accession number 49.52]	Reichenow (1895)
	Misahöhe	6	06°57'N, 00°35'E	F de Vree & E van der Straeten	27.XII.69	1♂ 1♀?	RMCA Tervuren [alcohol specimens nos 73.13.A291 & A292]	de Roo <i>et al</i> (1972)
	Ahoué-houé	7	07°33'N, 00°36'E	A de Roo, F de Vree & W Verheyen	18.VIII.68	1♂	RMCA Tervuren	de Roo <i>et al.</i> (1969)
	Ounabé	8	07°34'N, 00°59'E	C Veronese	28.X-4.XI.68	1♂ 1♀?	RMCA Tervuren [alcohol specimen nos 121.399 & 121.400]	de Roo (1970)
Ghana	Ejura	9	07°23'N, 01°15'W	WP Lowe	16.II.34	1♂	BMNH Tring [specimen number 1934.3.16.495]	Lowe (1937)

	Kyabobo Mountain, 2.5 km S of Shiare	10	08°16'N, 00°37'E	DC Moyer	13.X.94	1 ♂	LSU Baton Rouge [accession number 1373]	
Côte d'Ivoire	Béoumi	11	07°44'N, 05°23'W	WP Lowe & HR Hardy	11-15. XII.22	1 ♂	BMNH Tring	Bannerman (1923)
						1 ♀	[specimen numbers 1923.11.12.207 (type, G, of <i>eburneus</i>), 1923.11.12.208];	Bannerman & Lowe (1923)
						1 ♂	MNH Paris [specimen number C.G. 1927-62]	
Liberia	Paiata [= Peahatah, Pehata]	12	07°25'N, 09°40'W	GM Allen	14.X.26	1 ♀?	MCZ Harvard [specimen number 236485]	Allen (1930)
	Ganta	13	07°15'N, 08°59'W	H Beatty	20.III.48	1 ♀	Field Mus. Chicago [specimen number FMNH 186790]	Rand (1951)
	Mt Nimba	14	07°32'N, 08°32'W	A Forbes-Watson	I.68 - I.71	5 ♂ 4 ♀ 1 o	5 ♂, 3 ♀ BMNH Tring [specimen numbers 1977.20.1131-1138] (remaining 2 left in Mt Nimba collection?)	Colston & Curry-Lindahl (1986)
Sierra Leone	Kamasigi North	15	09°17'N, 11°57'W	GL Bates	9.II.30	1 o	BMNH Tring [specimen number 1930.12.3.328];	Bannerman (1932) Bates &
					11.II.30	1 ♂ ?	AMNH, New York [specimen number 787309]	Bannerman (1931)
	Buedu, nr Kailahun	16	08°17'N, 10°23'W	GL Bates	12.IV.30	1 ♂	BMNH Tring [specimen number 1930.12.3.326]	Bannerman (1932) Bates & Bannerman (1931)
	Njala	17	08°06'N, 12°05'W	TS Jones	29.VI.49	1 ♂	MCZ Harvard [specimen number 279264]	

Sierra Leone

Four specimens - three localities. Two of these localities are described briefly by Bates in Bates & Bannerman (1931). Of Kamasigi North, (700 ft a.s.l., c.230 m) he writes: "At Kamasigi I also got forest birds... This is because of the many arms or 'galleries' of the forest running into the savannah. Near Kamasigi was a small river with wooded banks in which were forest birds such as....the rare *Phyllastrephus*" (i.e. *baumanni*). Buedu (1,600 ft a.s.l., c.530 m) "is surrounded by second-growth thickets and nearly all birds I caught there were characteristic birds of such places..." There is no published information or relevant label data for the Njala specimen.

Literature and unpublished record information (see Table 2)

Nigeria

Button (1964a, 1967) gives notes on and compares the status of 15 species of bulbul from the Ilaro area. He says that *P. baumanni* is "fairly common" in "secondary bush and parkland with high trees" where it "frequents tops of trees and lower growth 10-70 feet high" (c.3-23 m) and in which it behaves by "perching or moving quietly [in the] topmost levels, often in groups of 3-5". Its voice is a "thrush-like 'seer, seer' sometimes with a few guttural tones". Conspicuous by its absence among the other bulbul species Button lists is Slender-billed Greenbul *Andropadus gracilirostris* and, indeed, Button (1964b) states that he did not record *A. gracilirostris* at Ilaro. However, the habitat preferences, foraging height, behaviour and voice ascribed by Button to *P. baumanni* fit (the generally widespread, common and superficially similar in appearance) *A. gracilirostris* perfectly (Chappuis 1975, Keith 1992, pers. obs.). It seems probable therefore that Button confounded these two species.

Elgood (1977) considered the "overall status" of *P. baumanni* in southwest Nigeria to be "widespread, occasional" while that of *A. gracilirostris* was "dispersed, occasional". Of the ten forest reserves for which he presented data, *baumanni* was reported from seven (Table 2). He recorded *A. gracilirostris* at only 4 of the 10 sites. Elgood (*loc. cit.*) indicates that, in general, he relied heavily on vocalisations to identify species and that he knew the voice of *P. baumanni* but not that of *A. gracilirostris*. Mist nets were used "to some extent" at only Gambari, Olokemeji and Lagos. He states that his Ipake (= Ilaro Forest Reserve of Button (1967)) records were supplemented by those of Button, who also used mist nets. Combining these facts, it therefore seems probable that the confusion of *P. baumanni* and *A. gracilirostris* shown by Button (1964a, 1967) (who thanks Elgood for help in identification of species on the basis of plumage and voice) also applied to Elgood.

Elgood indicates that the Lagos Relict record(s) of *P. baumanni* are not his own but, by implication, those of Gee & Heigham (1977). These authors, however, did not record *P. baumanni* during their work in the Lagos area between 1966 and 1975 and only report Lowe's Iju Waterworks specimen. Indeed, they suggest that *P. baumanni* may have been lost to the Lagos area although they were not able to visit

TABLE 2

Published and unpublished field records of *Phyllastrephus baumanni*

Country	Locality	Locality No. (Fig. 1)	Map reference	Reference	Assessment of Record (see text)
Nigeria	Ilaro	31	06°53'N, 03°01'E	Button (1964a, 1967)	Incorrect or doubtful
	Gambari	23	07°15'N, 03°52'E	Elgood (1977)	Unconfirmed
	Olokemeji	24	07°25'N, 03°32'E		Unconfirmed
	Ibadan Relict	5	07°22'N, 03°54'E		Confirmed
	Ipake	25	06°50'N, 03°03'E		Unconfirmed
	Araromi	26	07°15'N, 04°22'E		Unconfirmed
	Owena	27	07°14'N, 05°07'E		Unconfirmed
	Lagos Relict	1	06°20'N, 03°25'E		Confirmed
	Ogba Forest	32	06°15'N, 05°40'E	Johnson (1989)	Incorrect
	Pandam	33	08°40'N, 09°03'E	Elgood <i>et al.</i> (1994)	Incorrect
	Ebok Boje	18	06°17'N, 08°55'E	Hewson (<i>in litt.</i> 1998)	Confirmed
Ghana	Cape Coast	19	05°06'N, 01°17'W	Karr (1976)	Confirmed
	Tano-Ehuro Forest Reserve	34	05°58'N, 02°37'W	Nash (1990), Dutson & Branscombe (1990)	Incorrect or doubtful
	Bosuso (=Bosusu)	28	06°19'N, 00°24'W	Grimes (1987)	Unconfirmed
Côte d'Ivoire	Lamto	35	06°13'N, 05°02'W	Brunel & Thiollay (1968), Thiollay (1985)	Incorrect or doubtful
	Taï	37	05°51'N, 07°23'W	Thiollay (1985)	Incorrect
	San Pedro	36	04°45'N, 06°37'W	Weitkowitz (1979)	Incorrect or doubtful
Liberia	Wologizi	29	08°10'N, 09°56'W	Gatter (1997)	Unconfirmed
	Mt Balagizi	30	08°07'N, 09°55'W		Unconfirmed
Sierra Leone	Mogbai, Gola North Forest Reserve	38	07°39'N, 10°52'W	Allport <i>et al.</i> (1989)	Incorrect or doubtful
	Loma Mountains	20	09°14'N, 11°10'W	Field (<i>in litt.</i> 1993, 1998)	Confirmed
	Tingi Mountains	21	08°55'N, 10°46'W		Confirmed
	Bendugu	22	09°04'N, 11°30'W		Confirmed

the forests around Iju since they were then closed to access for security reasons. Elgood's (1977) Lagos Relict record therefore seems to refer back to Lowe's original specimen.

Previously, Elgood & Sibley (1964) had recorded *P. baumanni* from within a "10 mile radius of the city centre" (c.16 km) of Ibadan for which there was "skin evidence", collected by F. C. Sibley (confirmed by the specimen at LSU, Baton Rouge - see Table 1). Around Ibadan they report *P. baumanni* as being occasional - a "species met with a good many times over the years, but irregularly and in some cases not at all recently" and as a "forest species" within which its "most preferred habitat" is "thicket" but is also "regularly seen" in "secondary forest". *Andropadus gracilirostris* was considered rare, (i.e. not met with than on more than five occasions), too rarely for its habitat preferences to be assessed.

In summary, although the Ibadan skin confirms that some of Elgood's records are indeed of *P. baumanni* there is sufficient evidence to suggest that others were probably based on misidentifications of *A. gracilirostris*. It is not possible now to determine which are correct: his locality data, other than for Ibadan, have therefore to be treated with caution.

Johnson (1989), in a study of feeding habits of forest bulbuls, reports *P. baumanni* from Ogba Forest, southwest of Benin City - a site "reasonably typical of much of Nigeria's lowland forest". Johnson recorded *P. baumanni* at a density of 1 bird/5 ha, and described it as "a very cryptic species, seen only twice but frequently captured in mist nets". However, the morphometric data Johnson provides suggest that the species called by him *P. baumanni* is unlikely to have been so. For example, he gave bill length ($n=9$) 14-16-19 mm; tarsus length 25-27-29 mm, where the middle figures are, presumably, means. Compare these with data from Keith (1992) for 10 males and 4 females (mm): bill length - males 20.0 - 22.0 (mean 20.6), females 17.5 - 21.0 (mean 19.0); tarsus length - males 21.5-24.0 (mean 23.1), females 21.0 - 23.0 (mean 21.8). The differences between these figures indicate that Johnson's birds were unlikely to have been *P. baumanni* and the tarsus length, in particular, of the Ogba specimens suggest that the bird was not a *Phyllastrephus* at all.

Heigham (1976), in an avifaunal survey of mid-west Nigeria, makes use of Johnson's data from Ogba where *P. baumanni* is reported to be "seen regularly". It is of interest that Heigham gives no record of any *Illadopsis* sp. (Timaliidae) from Ogba: "the very long legs" that Johnson (1989) reports for *P. baumanni* may indicate the bird to have been an *Illadopsis*. D.N. Johnson (*in litt.* 1998) agrees that the morphometric data do rule out *P. baumanni* but is unable now, over 20 years after the study was made, to provide any further information which would resolve the identity of the species concerned.

There is, however, further, indirect evidence for believing it to have been an *Illadopsis*. Elgood *et al.* (1994) mention a record of *P. baumanni* from Pandam Game Reserve where it had been caught by C. Smeenk. Pandam is considerably further north than any other record of this species in Nigeria. Chris Smeenk (*in litt.* 1998) has kindly provided me with copies of photographic slides of the specimen taken at

the time and informed me that the capture was made in company with D.N. Johnson, who made the determination. The photographs prove, on comparison with skins in The Natural History Museum, to be of Brown Illadopsis *Illadopsis fulvescens iboensis*. *Illadopsis fulvescens* is known to occur in the Jos Plateau region (Dyer *et al.* 1986). It seems therefore that both the Ogba and Pandam records of *P. baumanni* are incorrect.

Elgood *et al.* (1994) summarise the status of *P. baumanni* in Nigeria as a "not uncommon resident at forest edges and in secondary growth right across the country, possibly less numerous in the southeast, north to Ibadan, Ife, and Enugu. Also netted at Pandam in gallery forest at southern edge of the Jos Plateau, but no other Guinea zone records." In view of the foregoing, this assessment merits revision.

More recently, a record of *P. baumanni* has come from Ebok Boje on the edge of the Obudu plateau in the south-east of the country. An individual was netted and photographed in February 1996 in 2 m high regrowth in an abandoned cassava field, some 50 m from the edge of forest, described as a mixture of remnant primary and secondary with clearings for banana (C.M. Hewson *in litt.* 1998). A copy of the photograph has kindly been sent to me by Chris Hewson and compared with skin material which confirms the identification.

Togo

Cheke & Walsh (1996) consider *P. baumanni* an "uncommon forest resident, but status uncertain as probably overlooked." They make it clear, however, that the only records for the country are the four specimens mentioned above and in Table 1.

Ghana

There is a record from Cape Coast (Karr 1976), where two individuals were netted in "forest converted to shrubland" on the campus of Cape Coast University in June 1971. The weights are given as 27.5 and 30.5 g but no other details are given. J.R. Karr (*in litt.* 1998) has provided me with further details. "The birds were caught in vegetation described as 'charcoal subclimax' which appeared to be maintained in a stunted condition as a consequence of the activities of wood-cutters. The result was a very short 'forest' with a maximum height of 16 to 20 ft (c.5 to 7 m) and less than 10% cover above 10 ft (c.3 m) high. Ground cover was sparse and vegetation density was relatively uniform through most of the profile with a rapid decrease above 10 ft (c.3 m). The avifauna was a mixture of second growth species associated with short vegetation profiles and a component of forest interior species." Dr Karr has also kindly provided me with copies of photographic slides taken of the captured birds. Comparison of these with skins in The Natural History Museum confirms the identification. One of these photographs has since been published (Fishpool 1999).

Nash (1990) and Dutson & Branscombe (1990) report the same (putative) records of *P. baumanni* from Tano-Ehuro Forest Reserve in the southwest of the country in 1989. Nash (1990) states that "up to 3 individuals were seen in the berry bushes at the edge of the clearings on three dates, and individuals were also seen in the nearby

logging park, and in a low bush beside a logging road.” In the tabulated list of species, however, four *Andropadus* species (*ansorgei*, *curvirostris*, *gracilis* and *virens*) are listed together simply as “small grey greenbuls” since they are “virtually indistinguishable in the field”. Further, *A. gracilirostris* is not mentioned in the species accounts while in the annotated list it is included but not recorded from Tano-Ehuro. The evidence given is inconclusive but the frugivorous habits and the open locations in which they were seen suggest that the birds were unlikely to have been *P. baumanni*, with *A. gracilirostris* a more probable alternative. J. Branscombe (verbally 1998) has since confirmed that he now considers the original identification to be unsafe.

Grimes (1987) summarises the status of *P. baumanni* in Ghana as being a “rare resident of forest undergrowth and forest edge, probably more widespread and more abundant than records suggest. Collected Ejura 16 Feb (Lowe 1937) and 2 netted at Cape Coast 7 Jun (J. Karr, D. James); also seen at Bosusu, east of Mpraeso (D. James).” I have been unable to obtain any further information on the Bosusu record. Bosusu is situated at about 250 m a.s.l. at the foot of the scarp of the Mampong hills which rise steeply nearby to over 500 m. From its location and topography, Bosusu would seem to be plausible habitat for *P. baumanni*.

Côte d’Ivoire

Brunel & Thiollay (1969) assessed its status in the country as “très rare. Collecté seulement une fois Lamto et, par Lowe, à Béoumi.” Thiollay (1985) later wrote that it had been “collected in Taï (Chappuis) and Beoumi (Lowe). Also observed from San Pedro (Weitkowitz) to Nimba and Lamto. Rare, primary forest.” There is no mention therefore of the Lamto specimen in the later paper. Thiollay (*in litt.* 1998) has written that his Lamto records “were based upon 1 or 2 birds caught in mistnets” but which in retrospect he admits were “not safely identified” and of birds seen subsequently that “could have been this species”. In addition, Chappuis (*in litt.* 1998), informs me that he has never seen or heard *P. baumanni*. The specimen to which Thiollay (1985) refers and initially thought by its collectors, Chappuis and Vieillard, to be *P. baumanni* was subsequently re-identified by Chappuis as *A. gracilirostris*. I have examined the specimen (in MNHN, Paris), which was collected in Côte d’Ivoire from Adiopodoumé, not Taï, and agree with the later identification. Indeed, the only specimen of *P. baumanni* in MNHN is one of Lowe’s Béoumi skins obtained through exchange with The Natural History Museum. It is not clear whether the observations of *P. baumanni* from Nimba reported by Thiollay (1985) refer to the Ivorian or Liberian side of the trans-border mountain, as a number of species known to occur on Liberian Nimba are admitted to the Ivorian list by Thiollay on inference.

Of the record from San Pedro, Weitkowitz (1979) states that *P. baumanni* was “seen in the understorey of rain forest”. The characteristics of the bird(s) seen were noted as an olive brown mantle, olive grey-brown belly and tail with a rust-coloured wash. No other details are given except for basic features which distinguish the species from White-throated Greenbul *Phyllastrephus albigularis* (also reported from San Pedro) and *Andropadus* spp. These differences are however of the sort gained

from comparison of skins, which the author says he has done, rather than from detailed field notes (no soft part colour data for example are provided). From the information given the identity of the bird(s) seen cannot be inferred with confidence but on distributional grounds at least (Fig. 1) it appears unlikely to have been *P. baumanni*. It seems therefore that the only substantiated record of *P. baumanni* from Côte d'Ivoire remains Lowe's from Béoumi.

Liberia

Gatter (1997), in addition to mentioning the previously published specimen records for Liberia detailed above, reports that he found *P. baumanni* to be a "rare to not uncommon resident especially in the north....not known from forest areas in southeast Liberia". He records having "mist-netted it in second growth at Wologizi and in ridge forest on Mt Balagizi, where the bird was found to be common." In montane primary and secondary forest on Mt Nimba, above 1,000-1,500 m, he reports it to be "a fairly common canopy species, occasionally mist-netted in undergrowth", but considers it not to be an undergrowth species, *contra* Keith (1992). He also found the species "in several mountain ranges of southern Nimba county as a dweller of lowland forest at higher elevations". These latter are not shown in Fig. 1 since no actual locality data are given and they are, in any case, adjacent to the mapped Nimba specimen locality. He reports the species to have "a quite large and stable population in the north of Liberia" and indeed provides an estimate of 15,000 pairs for the country. A colour photograph, labelled *P. baumanni*, is reproduced in this work.

This photograph, however, differs in a number of important features from that of *P. baumanni* reproduced in Fishpool (1999), the original of which has been compared

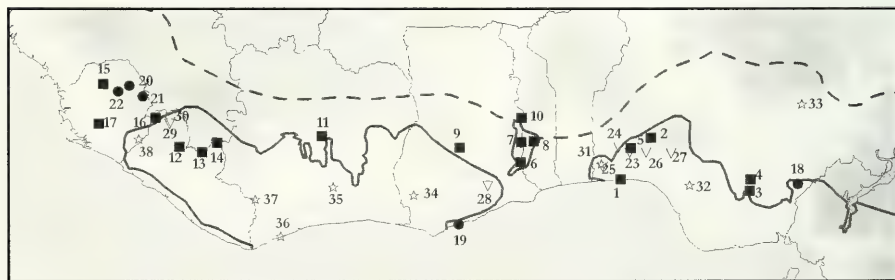


Fig. 1. Map of West Africa showing localities of specimens, published and unpublished records of Baumann's Greenbul, *Phyllastrephus baumanni*. Numbers correspond to localities given in Tables 1 and 2.

■ = specimen records, ● = confirmed sight records, ▼ = unconfirmed records, ☆ = incorrect or doubtful records. Solid line = approximate position of the limits of lowland rainforest zone; broken line = approximate position of the boundary between the rainforest-secondary grassland mosaic and Sudanian woodland and hatched area = Afromontane vegetation of the Cameroon highlands (simplified from White 1983). Pale shading = land above 330 m (1,000 ft), dark shading = land above 670 m (2,000 ft). Contour data lacking for parts of southeastern Nigeria and western Cameroon.

against skins in The Natural History Museum, including those from Nimba. In particular, the pale yellowish eye and the uniform scaly grey head, contrasting with the olive-green wing, are features suggestive rather of *Phyllastrephus albigularis*. Gatter (*in litt.* 1998) has, however, confirmed his belief that his photograph does illustrate *P. baumanni*. In view of this it is hard to know what to make of Gatter's account of *P. baumanni*. Certainly, the location and altitude of Mt Balagizi, which rises to 1,100 m, and nearby Wologizi seem likely to offer suitable habitat for *P. baumanni*, while it is, in any case, known from Nimba (Table 1). Uncertainty has to remain over these records, however, in view of the doubt of the birds' identity.

Sierra Leone

Allport *et al.* (1989) have a record of *P. baumanni* from Mogbai, Gola North Forest Reserve, where two birds were seen on 14 February 1989. At c. 300 m altitude Mogbai is considered by Allport *et al.* (1989) as unlogged primary forest with a closed canopy and fairly open undergrowth. P.V. Hayman, whose record this is, has informed me (verbally, 1998) that he cannot now be certain of the identity of the species involved. It seems advisable therefore to treat this record as doubtful.

Field (*in litt.* 1993, 1998), one the few ornithologists who knows *P. baumanni* well in life, has provided the following information for Sierra Leone. "Seen in only three areas: I) Loma Mountains, c.5,000 ft (c.1,670 m) or a bit lower. A dry, gloomy gallery with little undergrowth though ground choked with acanthaceous weed species, not far below the open plateau. Birds in middle shrub layer with various other species, e.g. *Cossypha polioptera* [Grey-winged Robin-Chat]. II) Tingi Mountains c.3,600 - 4,000 ft. (c.1,200 - 1,330 m) frequent sightings on various slopes of the central plateau, throughout the forest clothing the slopes, from the edge of the open plateau (once in small trees above a small gully on the plateau) down to the valley floor, both in open and thick forest. Seems widespread throughout, right down into 'proper' forest. Usually seen in undergrowth e.g. in streamside tangles, or in small thin shrubs of dark forest, close to stream, but also in the open mid-layer. Usually with other spp. e.g. *Camaroptera chloronota* [Olive-green Camaroptera], *Sylvietta denti* [Lemon-bellied Crombec], *Macrosphenus concolor* [Grey Longbill]. III) Bendugu c.1,350 - 1,400 ft (c.450 - 470 m) one sighting with a bird party of forest species in a patch of undistinguished forest, in an area where there is no continuous forest, only little patches."

Discussion

From the information of collection localities of authenticated specimens (plus associated label data), and from the distribution of these localities shown in Fig. 1, in relation to altitude and the main vegetational boundaries of the region, simplified from White (1983), the habitat preferences of Baumann's Greenbul appear to be quite narrow and well defined. They comprise mid-altitude forest occurring between c.500 and 1,100 m, often on hill and mountain slopes, both within and a little way

beyond the limits of the lowland forest zone. At lower altitudes (down to sea level), it mostly occurs in gallery forest and thicket on the fringes of the forest zone proper, both north and, as at Cape Coast, Ghana, south of it. Baumann's Greenbul seems to be closely tied to the forest-savanna ecotone across much of its range, entering more deeply into the lowland rainforest - secondary grassland mosaic zone only in the far west. In the Togo Mountains, along the Ghana-Togo border, it also penetrates a little way into the Sudanian woodland zone but overall it is confined throughout to a relatively narrow latitudinal range.

There is no evidence to suggest that *P. baumannii* is a species of lowland rainforest. Records of where it does occur within the lowland forest zone, other than those from higher altitude, are of observations shown here to be based on misidentifications or, at most, unsubstantiated sight records. This is supported by Field who (*in litt.* 1993) states "in my experience, it is not a rainforest species" and by a complete absence of records from recent intensive studies of lowland rainforest avifaunas in various parts of Upper Guinea, for example in Côte d'Ivoire (Gartshore *et al.* 1995). The only apparent exceptions are the specimens from Ganta and Paiata in Liberia (Fig. 1). As mentioned above, however, Rand (1951) wrote of rugged, forested hills near Ganta while Gatter (*in litt.* 1998) has pointed out that there are inselbergs that reach over 600 m a.s.l. in the vicinity of Paiata and that upland elements do occur, indicated by the fact that Allen (1930) collected a Lemon Dove *Aplopelia larvata* here. I believe it is likely, therefore, that in neither case were the *P. baumannii* specimens taken in lowland forest.

Unfortunately, the published misidentifications of *P. baumannii* noted above have resulted in a number of misleading impressions about the species being given wide currency in regional and continental works. These include its reputed association with lowland rain forest. This is explicit or implied in Hall & Moreau (1970) who considered it (united with *P. hypochloris*) "...a little known bird of primary forest"; Mackworth-Praed & Grant (1973) - "A bird of fairly wide range found both in the higher trees and also in forest undergrowth..."; Serle *et al.* (1977) - "Lowland forest from Sierra Leone to Nigeria" and Keith (1992) - "Inhabits thick undergrowth in primary and secondary forest and forest edge; also gallery forest, small woods in savanna, parklands with tall trees, thick brush along streams in orchard bush country". This mistaken belief may also date back to Bannerman (1936) who, not unreasonably based on the seven localities across six countries from which *P. baumannii* was then known, wrote that "its range evidently extends in Upper Guinea through the whole of the forest country, keeping to the thick undergrowth where it is seldom observed".

It should also be noted that, due to the confusion with *Andropadus gracilirostris* (Button 1964a) and *Illadopsis fulvescens* (Johnson 1989), inaccuracies of voice and foraging height and population density respectively appear in Keith (1992). Given that there is little doubt that Button's (1964a) notes refer to *A. gracilirostris*, the idea that *P. baumannii* frequents the tops of trees may, I think, be discounted. In common with many other *Phyllastrephus* spp. it is likely that *P. baumannii* is a skulking species that forages at and near ground level. Evidence for this comes from Field's field

observations quoted above, from the fact that the Ede, Nigeria, specimen was shot "near the ground" (Serle 1950), from the species' association with thicket and scrubby habitats, and from the fact that, where it occurs, it appears to be caught readily in mist nets. If so, this makes Gatter's (1997) comment that it is a canopy species hard to interpret.

The Ebok Boje record from southeastern Nigeria represents a small but significant eastward range extension since it brings the species virtually into contact with the closely related Cameroon Olive Greenbul *Phyllastrephus poensis*. This species occurs in montane forest between 1,000 and 2,200 m in the Cameroon highlands and adjacent parts of Nigeria, including the Obudu Plateau (Keith 1992, Elgood *et al.* 1994). It is possible that the presence of *P. poensis* in this region excludes *P. baumanni* from montane forest while the absence of a similar competitor further west means that it is there able to exploit such habitat.

The overall status of Baumann's Greenbul remains difficult to assess. It is widely but thinly distributed in a relatively restricted latitudinal range which is little worked by ornithologists or visited by birders. It seems likely, however, that it will be found at more localities across its range, and may be expected to occur in parts of Guinea adjacent to known localities in Liberia and Sierra Leone as well as, possibly, in Benin and the extreme west of Cameroon. Its lack of ready diagnostic features, skulking habits, preference for habitat often difficult of access, the numerous species with which it can be and has been confused and, as a result, inadequate treatment in the literature have all conspired to obscure its true status. Given that the species clearly remains an identification challenge in the field all reported sightings need to be supported with as much detail as possible.

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New distributional information for birds in southern Rio Grande do Sul, Brazil, and the first record of the Rufous Gnateater *Conopophaga lineata* for Uruguay

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Recent studies dealing with local avifaunas of Rio Grande do Sul, Brazil (*e.g.* Bencke 1996a,b, Mähler 1996, Mähler *et al.* 1996, Mauricio & Dias 1996, 1998) have revealed important range extensions and new records for many species since the detailed distributional analyses of Belton (1984, 1985, 1994).

Here we present new records and range extensions for 20 species of birds along Rio Grande do Sul's southern coastal plain and adjacent southeastern hills. Most records are the result of intensive fieldwork conducted at Capão Seco (31°48'S, 52°20'W), an area of extensive marshes next to Canal de São Gonçalo; Granja Quatro Irmãos (32°12'S, 52°35'W), a cattle and rice growing ranch; Saco da Mangueira (32°15'S, 52°20'W), a shallow bay in the estuary of Laguna dos Patos; and Banhado do Silveira (31°55'S, 52°12'W), a transitional area of fresh and saltwater marshes, all in the municipality of Rio Grande. Apart from some prior visits to these areas, bird surveys at Capão Seco and Saco da Mangueira were carried out at least monthly from March 1997 to May 1999, while at Granja Quatro Irmãos fieldwork was conducted on at least a 15-day interval basis between late November 1997 and May 1999. At Banhado do Silveira fieldwork was conducted monthly from January 1998 until June 1999. Records from Cerro das Almas (31°47'S, 52°35'W, altitude *c.* 100–260 m), a small chain of granitic hills covered with semi-deciduous forest in the municipality of Capão do Leão, were obtained during fieldwork carried out almost monthly between March 1997 and April 1999. Other localities and fieldwork effort are dealt under the species accounts. Unless stated, the altitude of the localities from which new records were obtained is around sea level. Tape-recordings will be archived at Arquivo Sonoro Prof. Elias P. Coelho, Universidade Federal do Rio de Janeiro, RJ. Systematic order follows Sick (1997).

Species accounts

LITTLE BLUE HERON *Egretta caerulea*

Belton (1994) and Mauricio & Dias (1996) each reported two records of adults from Rio Grande do Sul. We recorded young birds (immature plumage) at Capão Seco as follows: one 31 May 1998, four 9 and 10 August 1998 and five 13 August 1998. August records were in company of Snowy Egrets *Egretta thula*, in an open, shallow, grassy marsh, and may have been the same individuals. Additionally, GNM recorded an adult with white inner secondaries on 18 June 1999 at Lagoa Capororoca (31°16'S, 51°03'W), municipality of Tavares.

JABIRU *Jabiru mycteria*

An individual observed on 30 April 1993 at San Churi (or São Marcos) dam, extreme western Rio Grande do Sul, the same locality where local residents claimed to have seen eight in 1992, constitutes the species' only authentic state record (Belton 1994). Belton (1994) also mentioned a specimen of unknown origin or date of collection in the museum of Universidade Federal de Pelotas (now Museu Carlos Ritter), apparently acquired with the 19th century Carlos Ritter collection. On 20 January 1997, at Granja Quatro Irmãos, an adult Jabiru was observed by RAD with 108 Wood Storks *Mycteria americana* and an immature Roseate Spoonbill *Platalea ajaja*, resting along an irrigation ditch in a rice field. This record suggests that Jabirus might reach Rio Grande do Sul with Wood Storks, which are summer visitors to the state (*sensu* Belton 1994).

COMB DUCK *Sarkidiornis melanotos*

Scarce resident of Rio Grande do Sul's central trough (Belton 1994) with only one record for the state's southern coastal plain (Mähler *et al.* 1996). A male, two females and an immature, recorded by RAD on 30 March 1998 at Capão Seco, resting next to open water in an area of grassy marshes mingled with sedges and reed beds, represents the second record for the coastal plain.

SWAINSON'S HAWK *Buteo swainsoni*

Previously reported from seven scattered localities in Rio Grande do Sul, records falling between October and February (Ihering 1899, Belton 1994, Bencke 1996b). However, Bencke's (1996b) record from Monte Alverne is questionable and may indeed refer to the White-tailed Hawk *Buteo albicaudatus* (G. A. Bencke *in litt.* 1999). At Granja Quatro Irmãos, on 12 December 1997, RAD observed three immatures flying northeast, and on 15 December 1997, recorded 23 immatures soaring above tractors ploughing the soil, now and then plummeting down to seize disturbed mice and frogs, which were eaten on the ground. Additionally, on 5 January 1999, an immature was seen soaring high over Granja Quatro Irmãos (RAD).

OSPREY *Pandion haliaetus*

Rare North American visitor to Rio Grande do Sul, with five records from the northeastern littoral and central trough in spring and summer (Belton 1994). On 27 May 1997, we saw one fishing without success at Saco da Mangueira. Later, on 28 July 1997, one was recorded there by GNM. Additionally, another individual was observed and photographed by RAD over Granja Quatro Irmãos on 3 February 1999.

YELLOW-BREASTED CRAKE *Porzana flaviventer*

Only once recorded in Rio Grande do Sul, at São Leopoldo (Voss 1977). On 28 August 1998, GNM observed one for at least three minutes foraging on a floating mass of *Salvinia auriculata* (Salviniaceae) among reeds at Pontal da Barra marsh (31°47'S, 52°14'W), municipality of Pelotas. Despite intensive ornithological surveys

conducted in the past twelve years at this site, *P. flaviventer* had never been previously recorded. Its appearance there could be related to a major flood in the region during late August 1998, after a week of intense rain.

SPOTTED SANDPIPER *Actitis macularia*

Previously known in Rio Grande do Sul from seven widely scattered localities in the state's northern half (Belton 1994). Observed by RAD at Barra do Chuí (33°45'S, 53°22'W), along mud banks and the jetties of Arroio Chuí, the Brazil-Uruguay border, on 24 February 1998 (one individual in non-breeding plumage), 10 and 12 April 1998 (one and four individuals respectively, with few spots on their breasts and flanks), 11 and 13 October 1998 (two birds respectively in non-breeding plumage) and 17 and 20 February 1999 (three birds respectively, with slight spots on their flanks). The species was not recorded from the area between 4 and 8 July 1998.

RUFF *Philomachus pugnax*

In the Americas, this Palearctic species is a regular visitor to Alaska, and vagrant in the remaining continental United States of America, Canada, Guatemala, Panama, Barbados, Trinidad, Peru, Venezuela (Hayman *et al.* 1986) and Colombia (Hilty & Brown 1986). For eastern South America, the only published records are those of Sick (1993) for Taim and Lagoa do Peixe, Rio Grande do Sul, Brazil, which were replicated by Belton (1994). However, the record from Lagoa do Peixe is a mistake and the only valid one is that for Taim, which was obtained by T. A. Parker and T. S. Schulenberg on 30 October 1985 (Pacheco in press). On 29 June 1998, RAD observed an individual among 4 Greater Yellowlegs *Tringa melanoleuca*, on the muddy edge of a marsh at Capão Seco. The bird had white lores, pale buff underparts (white throat, underneck and belly), pale buff-fringed scapulars, tertials and wing-coverts, and yellow legs, intermediate between the juvenile male and non-breeding male depicted in Hayman *et al.* (1986).

SPOT-WINGED PIGEON *Columba maculosa*

Previously known in Rio Grande do Sul from the state's western tip, where presumably present year-round, and also from the Uruguayan border area near Bagé and Herval, where recorded in June and July (Belton 1994). Two to four individuals, including one singing bird, were observed by RAD at Barra do Chuí between 10 and 12 October 1998, in an area dominated by low, bushy acacias close to the beach. Despite intensive surveys conducted by RAD between 22-24 February, 10-13 April, 04-08 July 1998 and 16-20 February 1999 at this locality, no further records were obtained.

ASH-COLOURED CUCKOO *Coccyzus cinereus*

Scarce species, recorded in Rio Grande do Sul from five widely scattered areas across the state's southern half (Belton 1994). A badly mangled corpse was found by RAD at km 53 of highway BR 392 at Capão Seco on 17 March 1997, an area with herbaceous vegetation and few corticeira trees (*Erythrina cristagalli*, Leguminosae)

in extensive marshland. On 25 March 1997, RAD recorded another individual at the same place among the corticeiras. Additionally, one was seen and tape-recorded by RAD on 27 November 1998, and another later seen on 27 March 1999, at Banhado do Silveira, in an area dominated by maricá trees (*Mimosa bimucronata*, Leguminosae) with a few corticeiras close to marshes. With the exception of a sighting in June, all other records from Rio Grande do Sul fall between 1 November and 4 May (Belton 1994), indicating that the species may be a spring-summer resident that leaves the state during the autumn, as records from Uruguay (Gore & Gepp 1978) and Buenos Aires province, Argentina (Narosky & Di Giacomo 1993) demonstrate. Furthermore, recent winter records from Brazilian Amazonia may be austral migrants (Sick 1997). Birds from Capão Seco were clearly in transit, since habitat is not adequate for the species, while records from Banhado do Silveira, where habitat seems more appropriate and extensive, were the only ones obtained in 17 months of fieldwork.

LITTLE NIGHTJAR *Caprimulgus parvulus*

Known in Rio Grande do Sul from the central trough, the central-north sector and west of 55°W (Belton 1994). Two were heard singing by GNM at the edge of an *Eucalyptus* sp. grove on 24 November 1998 at 1940 h near the town of Capão do Leão (31°46'S, 52°31'W, altitude c. 40 m).

VIOLET-CAPPED WOODNYMPH *Thalurania glaucopis*

Belton (1994) recorded this species in Rio Grande do Sul from the central trough adjacent to the Serra Geral escarpment, extreme north along the Rio Uruguay and from an area north of the Rio Camaquã. This species was an uncommon to fairly common resident throughout 1995-1996 at Arroio Andrade forest (31°27'S, 52°28'W, altitude c. 300 m), municipality of Pelotas (GNM), and scarcer, but also found throughout the year at Cerro das Almas (GNM). Occasionally recorded in 1994-1997 at other forest fragments mentioned by Maurício & Dias (1998) in the municipalities of Pelotas, Morro Redondo and São Lourenço do Sul, with the exception of Parque Farroupilha. Our records extend the species' known distribution c. 100 km southwards, since Uruguayan records (Cuella and Gerzenstein 1962) have been contested (Cuella 1985).

WHITE WOODPECKER *Melanerpes candidus*

Known in Rio Grande do Sul from the northwest corner, isolated areas west of 53°W, São Leopoldo and the Pólo Petroquímico area at Triunfo (Belton 1994). One individual was seen by GNM in *Eucalyptus* sp. at Domingos Petrollini (32°00'S, 52°19'W), municipality of Rio Grande, on 6 September 1998. RAD observed one in the company of a Green-barred Woodpecker *Colaptes melanochloros* and a Field Flicker *C. campestris*, in *Eucalyptus* spp. at Granja Quatro Irmãos, on 4 January 1999, and later, on 26 January 1999, at the same spot, saw two individuals which chased a third one, tape-recording them. These are the first records for Rio Grande do Sul's coastal plain.

RUFOUS GNATEATER *Conopophaga lineata*

Prior to Mauricio & Dias' (1998) records from several localities in the municipality of Pelotas, *C. lineata* was known in Rio Grande do Sul only from the central trough northwards (Belton 1994). On 7 October 1997, at Passo do Centurião (32°08'S, 53°43'W), municipality of Herval, on the Brazil-Uruguay border, GNM tape-recorded two singing individuals and mist-netted another bird (photographed by G. Mastrantonio) in the gallery-forest of Rio Jaguarão. Two others were heard singing on the Uruguayan side of the river (Paso del Centurión) on this same date, representing the first record of this species for Uruguay. Farther north, also in the municipality of Herval, an individual was heard in a small woodlot (31°53'S, 53°05'W) near Rio Santa Maria on 17 December 1996. Additionally, GNM recorded this species throughout 1998 in small woodlots near Cerro das Almas. Furthermore, G. A. Bencke (*in litt.* 1999) recorded this species from Rio Grande do Sul's southeastern hills in areas intermediate between Mauricio & Dias' (1998) records from Pelotas and the central trough: Horto Florestal Ramos (30°28'S, 52°07'W), municipality of São Jerônimo, on October 1997; Serra dos Prestes (30°50'S, 52°34'W), municipality of Encruzilhada do Sul, on December 1996; and Passo da Guarda (30°54'S, 52°27'W), on the Rio Camaquã, in January 1986. Our records from Passo do Centurião extend the species' known distribution *c.* 100 km south-southwestwards.

SEDGE WREN *Cistothorus platensis*

Previously known in Rio Grande do Sul from five scattered localities (Belton 1994), Pontal da Barra marsh (Maurício & Dias 1996) and Estação Ecológica do Taim (Mähler *et al.* 1996). We recorded this species between January 1998 and April 1999 (except April 1998 when fieldwork was not conducted) in salt marshes of Saco da Mangueira. We also recorded it on 18 February, 29 July 1998 and monthly between January and June 1999 (except May, when fieldwork was not conducted) in salt marshes at Banhado do Silveira. One was seen on 24 February 1999 at Ilha da Feitoria (31°38'S, 52°02'W), municipality of Pelotas, in similar vegetation.

GUIRA TANAGER *Hemithraupis guira*

Belton (1994) recorded the species from the foot of the Serra Geral escarpment to the north and also from Itapuã. One male observed on 12 May 1997, as it foraged together with three Sharp-billed Xenops *Heliobletus contaminatus*, in the sub-canopy of Rio Camaquã's gallery-forest at Paredão (30°55'S, 52°57'W, altitude *c.* 100 m), municipality of Encruzilhada do Sul, represents the first record of this species for Rio Grande do Sul's southeastern hills.

MARSH SEEDEATER *Sporophila palustris*

This rare seedeater is known in Rio Grande do Sul from four scattered marshy localities in the south and west (Belton 1994) and from Pontal da Barra marsh (Maurício & Dias 1996). A male and female were seen by RAD on 29 November 1997 in a marshy area behind the coastal dunes, *c.* 12 km southwest of Cassino beach (32°11'S, 52°10'W),

municipality of Rio Grande, where a male was also observed on 19 November 1998. These records were the only ones in 20 months of fieldwork starting in October 1997. Furthermore, we recorded up to 6-7 males (one tape-recorded) and 6 female-plumaged birds along a 2 km transect walked on 13 February 1998 at the edge of Banhado do Maçarico (32°16'S, 52°12'W), also in the municipality of Rio Grande; none were seen here by GNM on 5 June 1998. On 30-31 December 1998, GNM saw five males at the same place, tape-recording the songs of two of them, including an immature. Both localities are part of an extensive wetland area characterized by the presence of sedges and reed beds lined with wet grasslands and mingled with sandy fields and swamp forests. This relatively isolated region, comprising 411.62 km² (Tagliani 1997), may be one of the most important areas for the conservation of this endangered seedeater in Brazil. Our new records, restricted to November, December and February, support the suspicion that *S. palustris* is a spring-summer resident in Rio Grande do Sul (Belton 1994, Mauricio & Dias 1996).

LESSER SEEDFINCH *Oryzoborus angolensis*

Belton (1994) regarded this species rare in Rio Grande do Sul and reported it from five scattered localities, all from the central trough northwards. Mähler (1996) reported an additional record from Parque Estadual do Turvo, in the state's northwestern sector. On 17 January 1998, we heard one singing at a swamp forest (31°58'S, 52°12'W) bordering Banhado do Vinte-e-Cinco, municipality of Rio Grande. On 12 February 1998, six singing males were heard and one tape-recorded in swamp forests along a 2 km transect at Banhado do Maçarico. The species was not recorded on 5 June and 30-31 December 1998 at the latter locality, possibly due to the occurrence of strong winds on these dates (GNM). Our records extend the known range of *O. angolensis* c. 200 km southwards.

GREEN-WINGED SALTATOR *Saltator similis*

Previously recorded in Rio Grande do Sul from the state's western, northern and northeastern sectors (Belton 1994). One individual was tape-recorded in swamp forest amidst marshes at Ilha da Feitoria on 19 November 1997 (GNM). At Cerro das Almas, GNM recorded this species in September, October, November and December 1998 in capoeira and primary forest edges.

COMMON WAXBILL *Estrilda astrild*

Known in Rio Grande do Sul from the metropolitan area of Porto Alegre, Novo Hamburgo, the Pólo Petroquímico area at Triunfo and north of Pelotas, the first records dating back to the early 1960s (Belton 1994). We observed this species regularly throughout the year since 1994 in urban and suburban areas of Pelotas, although we have previous undated records from the mid-1980s onwards. The first published record from Pelotas was based on S. Lanyon's observation of a small flock on 14 December 1986 in a village N of the city (Belton 1994). R. Baltar (pers. comm. 1997) states that *E. astrild* was present even earlier around Pelotas, for he

found nests in citrus trees in 1969. This species is always found close to human habitation, favouring abandoned grassy gardens and fields. Flocks were usually of 5 – 10 birds, but concentrations of up to 40-50 were not rare, especially in February and March, when many immatures joined these large groups. *E. astrild* was formerly a very popular cage-bird in Pelotas and this introduced population originated from individuals which escaped from captivity; some local range expansion may be in progress. We additionally recorded *E. astrild* at São Lourenço do Sul (31°22'S, 51°58'W; two on 13 December 1996); Capão do Leão (31°46'S, 52°31'W; two on 25 June 1997); the campus of Universidade Federal de Pelotas (31°48'S, 52°24'W; some heard on 1 July 1997); Saco da Mangueira (12 on 30 June 1997) and Vila da Quinta (32°04'S, 52°15'W; three on 18 February 1998).

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New and noteworthy bird records from Santa Catarina state, Brazil

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The avifauna of Santa Catarina was little known until 1978, when Helmut Sick was invited to prepare a bird inventory for the state. Previously, only scattered data existed, principally from collecting expeditions undertaken in the late nineteenth and early twentieth centuries (e.g. by Berlepsch, Kaempfer and Underdown). Several avifaunal lists have since been prepared for the state (Sick *et al.* 1979, 1981, Bege & Marterer 1991, Rosário 1996). Thus at present, Santa Catarina is, along with Rio Grande do Sul (Belton 1984, 1985, 1994), the only Brazilian state possessing a detailed distributional review of its avifauna.

The Santa Catarina avifauna originates principally from three different sources. Coastal and northern areas exhibit strong affinities with the highly endemic avifauna of the Serra do Mar (see Cracraft 1985). In the south of the state, typical pampas species, e.g. many waterbirds, Rallidae, Wren-like Rushbird *Phleocryptes melanops* and Many-coloured Rush-tyrant *Tachuris rubrigastra*, are the most obvious feature, and are similar to the avifauna of much of interior Rio Grande do Sul. Finally, Planalto taxa, including several *Araucaria* specialists and relict species that arrived during the last Cenozoic glaciations from the Andes and Patagonia (Sick 1985), are an important constituent of the avifauna of western Santa Catarina and the campos (grasslands) of the eastern serras.

Here, we present new and noteworthy avifaunal records for 37 species from the state, including 11 species not previously recorded in Santa Catarina, 12 species of conservation concern at either national or global levels, principally species considered

globally threatened or near-threatened (Collar *et al.* 1992, 1994), and 14 species for which fewer than three previous state records were available, or for which our records provide the southernmost ever. Details of other species for which few state records exist will be presented elsewhere (Naka *et al.* in press). We consider new species for the state to be those not mentioned by Sick *et al.* 1979, 1981), Bege & Marterer (1991) or Rosário (1996).

Most information comes from short trips during 1995–2000 by LNN and MAGA, except data gathered from Ilha de Santa Catarina which was visited more frequently (Naka 1998), and brief visits to the state made by JMB, GMK and JAT in January 1986, March 1994, October 1995, February and April 1997, October 1998 and July 2000.

Avifaunal surveys were undertaken in the following localities (see Fig. 1.), for which we present additional details and information concerning their conservation importance.

Reserva Particular do Patrimônio Natural de Volta Velha (c. 26°04'S 48°38'W). This privately owned 1,500 ha reserve is located in northeasternmost Santa Catarina, near Itapoá. The reserve protects one of the last remnants of lowland evergreen forest in the state. Some mature primary forest can be found here, as well as in the surrounding, but unprotected, area.

Ilha de Santa Catarina (27°10'–27°50'S 48°25'–48°35'W), Florianópolis municipality, is a 54 km-long and 18 km-wide island, separated from the mainland by a 500 m-wide



Figure 1. Map of Santa Catarina state showing the location of the six study localities mentioned in the text: A = Reserva Particular do Patrimônio Natural de Volta Velha; B = Salto do Pirai; C = Correia Pinto; D = Parque Botânico do Morro do Baú; E = Ilha de Santa Catarina; and F = Urubici and São Joaquim area. Inset: map of South America showing the position of Santa Catarina state within southern Brazil.

channel. Much of the island's vegetation has been modified by human activity, although it possesses some relatively well preserved Atlantic Forest, as well as patches of mangrove and restinga (coastal white-sand forests, up to 5 m tall, with many terrestrial bromeliads). See Naka & Rodrigues 2000 for more information.

Parque Botânico do Morro do Baú (26°47'–26°50'S 48°55'–48°57'W), Ilhota and Luís Alves municipalities. This protected area is composed of 750 ha of well-preserved montane and lower montane evergreen forest (at 200–820 m) (a full description of the area, as well as its avifauna, can be found in Marterer (1996).

Salto do Pirai (26°18'S 48°50'W), near Joinville, is protected by the Estação Ecológica Estadual do Bracinho, which encompasses the waterfall and 400 ha of lower montane, montane and upper-montane evergreen forest. The reserve was created 50 years ago in order to protect the forest around the waterfall, and thus assure water for a small hydroelectric power station established to provide power locally (see Machado 1996 for more details of the avifauna of this area). We, and additional co-workers, will present elsewhere (Mazar Barnett *et al.* in press) details of the rediscovery and subsequent observations of Kaempfer's Tody-tyrant *Hemitriccus kaempferi* at this site in the period since 1991, as well as commenting on the exceptional conservation importance of the area.

Urubici and São Joaquim area (c. 27°59'S 49°39'W) is an area of mixed planalto woodland with a predominance of *Araucaria* and areas of dense bamboo undergrowth at 900–1,000 m. The main areas researched were in the outskirts of Urubici, but we also visited the neighbouring Morro da Igreja and the São Joaquim National Park which encompasses higher altitudes, to over 1,600 m, with *Araucaria* forests and campos de altitude (open grasslands).

Correia Pinto area (27°36'S 50°24'W) consists of a privately-owned plantation area near the town of Correia Pinto with large tracts of pines and *Eucalyptus* destined for paper and cellulose production. Between these tracts, there are patches of *Araucaria* forest with an interesting avifauna.

Most of our records are documented with tape-recordings or photographs and this is stated in the text. Tape-recordings have been deposited in LNS-CLO and ASEC-UFRJ (see below for abbreviations). Details of those records documented photographically are available from LNN. Sight records largely involved easily identified species, or those for which the authors' had extensive previous field experience. In a very small number of instances, we present details of the diagnostic characters used to determine sight or acoustic identifications.

Acronyms used: AMNH = American Museum of Natural History, New York; ASEC-UFRJ = Arquivo Sonoro Elias Coelho—Universidade Federal do Rio de Janeiro; CCNPPII = Coleção do Colégio Pedro II, Blumenau; LNS-CLO = Library of Natural Sounds—Cornell Laboratory of Ornithology; MNRJ = Museu Nacional do Rio de

Janeiro; MSCJ = Museu do Seminário Coração de Jesus, Corupá; UFSC = Universidade Federal de Santa Catarina.

New state records

GREY-LINED HAWK *Buteo nitidus*

During January 1986, a single bird was repeatedly seen in the outskirts of Canasvieiras, north of Florianópolis (JMB). The bird was encountered regularly on an exposed perch at the edge of a degraded woodlot close to habitation, and sometimes even in *Cecropia* trees in an adjacent clearing. There were no previous records in the state (Rosário 1996). This appears to be the southernmost locality in Brazil, where it was previously known to occur only as far south as São Paulo (Sick 1997), and represents a range extension of at least 250 km. It occurs in neighbouring Misiones, Argentina (Chebez 1996).

TURQUOISE-FRONTED PARROT *Amazona aestiva*

Three, subsequently up to nine birds, have been resident, and were tape-recorded, in the northern part of Ilha de Santa Catarina since August 1997 (LNN, MAGA). On one occasion, a pair was noted prospecting potential nest-holes in a Jerivá palm *Arecastrum romanzoffianum*. It is equally possible that these birds were escapes or natural colonists, as they have been noted at Porto Alegre, Rio Grande do Sul (J. Albuquerque, pers. comm.). *Amazona aestiva* and a number of other parrot species have established feral populations around Buenos Aires, Argentina (Chebez & Bertonatti 1991). This is the first confirmed state record; Rosário (1996) considered it unconfirmed, based on two undated specimens without locality, held in the CCNPII, Blumenau and MSCJ, Corupá. More significantly, Sick (1997) stated that this species only occurs away from the coast, although Bersato (paper presented at the Third Brazilian Ornithological Congress) has documented the species' regular presence in an urban area of Porto Alegre.

LESSER SWALLOW-TAILED SWIFT *Panyptila cayennensis*

One seen at Salto do Piraí on 4 October 1995 (JAT) is apparently the first state record, as the species was not included by Rosário (1996) and is the southernmost ever. In southeast Brazil, previously recorded south to São Paulo state (Sibley 1996, Sick 1997).

BAR-WINGED CINCLODES *Cinclodes fuscus*

One at Lagoa do Peri, Ilha de Santa Catarina, on 25 May 1996 (LNN). This is the northernmost record for the Atlantic coast of Brazil and the first state record. Confusion with its highland congener, Long-tailed Cinclodes *Cinclodes pabsti*, is highly improbable, as it does not migrate to the lowlands and is not known to overlap with *fuscus* (Belton 1984, Ridgely & Tudor 1994, Sick 1997). Nominate *C. f. fuscus* is a common migrant, a few reaching south Paraguay (Hayes *et al.* 1994), north-east

Argentina and extreme south Brazil, during the austral winter (Ridgely & Tudor 1994). All previous Brazilian records are from Rio Grande do Sul, where it is considered uncommon (Belton 1984, Sick 1997).

MARSH ANTWREN *Stymphalornis acutirostris*

A male was heard calling and seen in a very scrubby marsh at Volta Velha, Itapoá on 15 July 2000 (JMB, DB), within low-lying terrain that is probably seasonally inundated. Surrounding areas had been cleared for palmito plantations. The individual was tape-recorded and photographed. There were only a couple of tiny patches of *Typha* in this area, and the habitat was thus quite different from elsewhere within the restricted range, in the Paraná river basin, of this recently described species (Bornschein *et al.* 1995). Nearby, and just a few metres from the Paraná border (at 25°59'S 48°42'W), several of this species were found along the road from Garuva to Itapoá, in different patches of *Typha*. They were highly responsive to playback (LNN, MAGA, ALR and CAM). Marcos Bornschein & Bianca Reinert had already found the species in northernmost Santa Catarina, but their records are unpublished. Considered globally threatened (BirdLife International in press).

SLATY BRISTLEFRONT *Merulaxis ater*

One was heard at Urubici, on 11 February 1997 (GMK) and one was seen well and tape-recorded at Salto do Pirai, Joinville, at 240 m, on 29 October 1998 (MAE, GMK *et al.*). Songs from Santa Catarina appear to differ from those further north but, as noted by Ricardo Parrini and Bret Whitney (both *in litt.* 1999), the songs of those in the highlands of Rio de Janeiro further appear to differ from those on the lower slopes of the Serra do Mar, in São Paulo and Paraná. Our records are the southernmost ever and extend the known range by at least 240 km.

GREY-CAPPED TYRANNULET *Phyllomyias griseicapilla*

One at Salto do Pirai on 5 October 1995 (JAT) foraged in low trees and shrubs by a streamside path. This species was mentioned as hypothetical by Rosário (1996) but our record, which is mapped in Clay *et al.* (1998), appears to be the first specific locality for the species in the state.

GREY ELAENIA *Myiopagis caniceps*

At Salto do Pirai, one was singing on 4 October 1995 and a pair was seen on 5 October 1995 (JAT), relatively high in the canopy of forest-edge trees. At Volta Velha, Itapoá one on 15 July and a pair on 16 July 2000 were tape-recorded and, as usual, moved through the canopy but did not follow mixed-species flocks (JMB, DB). It was not listed for the state by Rosário (1996) and these appear to be the first records for Santa Catarina, although the species is known to occur in neighbouring Paraná and south to northeast and northwest Argentina (Ridgely & Tudor 1994, Scherer-Neto & Straube 1995).

WHITE-CRESTED ELAENIA *Elaenia albiceps*

One, on 9 April 1997, in an open, shrubby area adjacent to some houses just outside the reserve at Salto do Pirai (JMB). It was easily identified by the presence of a striking white centre to the crown, visible without the individual showing traces of agitation. It was probably an austral migrant of the *chilensis* population. Four specimens from Rio Grande do Sul were all taken in February and were presumed to be northbound migrants (Belton 1985). Marini & Cavalcanti (1990) suggested part of the population migrates north along the Brazilian coast, and the species is recorded annually in the coastal fringe of Rio de Janeiro in February–early April (Pacheco & Gonzaga 1994). The species can probably be expected on passage with some regularity throughout eastern Santa Catarina in early autumn.

SHORT-CRESTED FLYCATCHER *Myiarchus ferox*

One in mangroves at the Reserva Extrativista Marinha of Pirajubaé, Ilha de Santa Catarina, on 27 October 1997 (LNN) was extremely tame, uttering its diagnostic “prrrrt” call, unique among *Myiarchus*, which can be considered conclusive for identifying the species. This is the first state record: the species has not been recorded subsequently in the area, perhaps indicating that it was a migrant or wanderer.

EPAULET ORIOLE *Icterus cayanensis*

A pair, of the race *I. c. pyrrhopterus*, was seen on the edge of second-growth forest surrounded by pasture at Rio Vermelho, Ilha de Santa Catarina, on 16 March 1998 (LNN, MAGA). The rufous patches on the wings were seen clearly. This is the first state record, although its presence was expected as there are numerous records in Rio Grande do Sul (Belton 1985) and Paraná (Scherer Neto & Straube 1995), as well as neighbouring Argentina.

Species of conservation concern

YELLOW-LEGGED TINAMOU *Crypturellus noctivagus*

Several were heard and one tape-recorded at Volta Velha, Itapoá on 14–15 October 1998 (LNN, MAGA, ALR) and one was tape-recorded in undisturbed forest at the same locality on 15 July 2000 (JMB, DB). This threatened Brazilian endemic (Bernardes *et al.* 1990) occurs from Piauí and Pernambuco to Rio Grande do Sul (Pinto 1978). Few records are available for the nominate race, *C. n. noctivagus*, which occurs from southern Bahia to Rio Grande do Sul, and this taxon is apparently extinct in part of its range (Sick 1997). It is considered rare in the Atlantic Forest of Santa Catarina by Rosário (1996) with only two recent records, both in October 1978 (from Parque Botânico do Morro do Baú, Ilhota, and Reserva Biológica do Sassafrás, Doutor Pedrinho), and a 1959 specimen from Sombrio held in MSCJ.

PURPLE-WINGED GROUND-DOVE *Claravis godefrida*

One was flushed and three were heard and tape-recorded at Urubici, on 11 February 1997 (DBe, GMK, RM, RSRW). There was only one previous state record, from

Blumenau in the 19th century (Collar *et al.* 1992, Rosário 1996). Records involving more than one individual, even historically, are very few and it is therefore worth presenting here a previously unpublished record of a pair at Ubatuba, São Paulo, on 30 January 1997 (DBe, GMK, RM, RSRW). Considered globally threatened (Collar *et al.* 1992, 1994).

MOTTLED PICULET *Picumnus nebulosus*

One was seen at Urubici, at 975 m, on 11 February 1997 (DBe, RM, RSRW). On 15 April 1997, a female was found at the same locality, following a mixed-species flock (JMB). The bird remained feeding and resting for *c.* 10 minutes in an area of open mixed woodland with some *Araucaria* and dense bamboo undergrowth on a steep slope. It worked along small branches *c.* 7–8 m. above ground. After resting and preening for a while it flew downslope to rejoin the mixed flock. Another with a mixed-species flock at Urubici, at 1,400 m, on the Morro da Igreja trail, on 14 June 1998, foraged *c.* 1 m above the ground in scrub by the road (LNN). Only one state record has been published, at Lages, in January 1990 (Rosário 1996). This poorly known species is extensively distributed in northern Rio Grande do Sul (Belton 1984, Sick 1997), and has probably been overlooked in most adjacent areas of Santa Catarina. The species occurs in south-east Brazil north to Paraná, Uruguay and north-east Argentina in Misiones and Corrientes (Sibley 1996). Parker *et al.* (1996) did not record the species' occurrence above 1,100 m, making the June 1998 record a considerable upslope altitudinal range extension.

HELMETED WOODPECKER *Dryocopus galeatus*

Two were seen at Volta Velha, Itapoá, on 15 October 1998, when they flew over an open area as they apparently moved between forest patches (LNN, MAGA, ALR). They paused on a single small tree for *c.* 1 minute. After drumming a few times on the main trunk, *c.* 1 m above ground, the birds departed for another area of undisturbed lowland evergreen forest. No modern state records (Rosário 1996), with the most recent occurrence being in 1946. This globally threatened species occurs from São Paulo south to Rio Grande do Sul states, in southeast Brazil, Misiones, in adjacent north-east Argentina, and in eastern Paraguay (Collar *et al.* 1992). It is also considered locally threatened in Brazil (Bernardes *et al.* 1990).

CANEBRAKE GROUND CREEPER *Clibanornis dendrocolaptoides*

Two birds were tape-recorded at 975 m, in the vicinity of Urubici, on 11 February 1997 (DBe, GMK, RM, RSRW). A pair was observed and tape-recorded on 16 April 1997 near Urubici (JMB). The birds were in a dense bamboo stand within mixed upland forest containing sparse *Araucaria* trees, on a steep slope. Known from just one other locality in the state (Três Barras, in the extreme north); birds were first observed at Urubici, by Fernando Pacheco and Bret Whitney, in 1991 (Rosário 1996). Frank Lambert (*in litt.* 1999) found the species to be quite common around Urubici in November 1997. He saw or heard the species regularly on steep-sided slopes and

flatter ridges in areas of bamboo with rather open and an almost closed canopy in areas where *Araucaria* was either present or dominated the flora. There are several sections of habitat around Urubici that match this description, and it is conceivable that a significant population of *Clibanornis* persists in this area. However, several places have, in the last few years, been converted to agricultural land or used for urban development and these threats are potentially significant. This is a poorly known and seldom recorded species. It was considered rare in Rio Grande do Sul (Belton 1984) but is apparently comparatively widespread in the eastern half of the planalto in that state (R. A. Dias pers. comm. 1999).

UNICOLORED ANTWREN *Myrmotherula unicolor*

Two on 3 October 1995, four on 4 October 1995 (JAT) and a solitary female and a female with an immature male on 9 April 1997 (JMB), all at Salto do Pirai. These last birds were associated with loose mixed flocks containing Spot-breasted Antwreio *Dysithamnus stictothorax* and several furnariids. Their calls were tape-recorded. One was seen at the same locality on 29 October 1998 (GMK *et al.*). On 18 July 2000, one was observed foraging in the mid-storey, within a mixed-species flock, at Volta Velha, Itapoá (LNN, CAM). The species is known from six sites in the state all in the Atlantic Forest region (Rosário 1996, Whitney & Pacheco 1995), including Salto do Pirai, where Emil Kaempfer took an adult female and young male in June 1929 (Naumburg 1939). Our sight records appear to be the first at this locality since then. Considered globally threatened (Collar *et al.* 1992, 1994).

SALVADORI'S ANTWREN *Myrmotherula minor*

Two at Salto do Pirai on 3 October 1995 (JAT), one of which was an adult male, were seen in lower elevational, streamside forest. It was not listed for Santa Catarina by Rosário (1996), although Whitney & Pacheco (1995) listed a specimen record from Hansa-Humboldt (= Corupá), making this sight record the second state occurrence. Considered globally threatened (Collar *et al.* 1992, 1994).

SÃO PAULO TYRANNULET *Phylloscartes paulistus*

At least three were seen at Urubici on 11 February 1997 (DBe, GMK, RM, RSRW) and, at Salto do Pirai, two were seen on 4 October 1995, outside the reserve in the forest edge within 100 m of the river (JAT) with one there on 29 October 1998 (GMK *et al.*). Two localities for the species are known in Santa Catarina: Salto do Pirai, where it was collected in June 1929 and from where there are sight records in July 1991, March 1992 (Wege & Long 1995) and February 1994, and Blumenau (Rosário 1996). Our sight records from Urubici are the southernmost ever in Brazil and extend the known range by c. 130 km. Considered globally threatened (Collar *et al.* 1992, 1994).

RESTINGA TYRANNULET *Phylloscartes kronei*

Five to seven individuals were encountered on 15 and 16 July 2000 at Volta Velha, Itapoá (JMB, DB), usually in pairs and sometimes following mixed-species flocks, in

lower and more open restinga, open areas and forest edge. Calls from several individuals were tape-recorded. They worked areas 1–4 m above ground in the outer third and canopies of low trees, perching on exposed branches. No wing-flicking was observed, but a strong wing-slurring was heard once and tape-recorded. Willis & Oniki (1992) mention a specimen from Santa Catarina in the description of this species, but the record was overlooked by Rosário (1996) and it is possible that some or most of the littoral records of Mottle-cheeked Tyrannulet *P. ventralis* mapped by Rosário (1996) actually refer to *kronei*. DB has also recorded the species at Tabuleiro, on the mainland adjacent to Ilha de Santa Catarina. The species has recently been discovered as far south as Rio Grande do Sul (Bencke *et al.* 2000), and can presumably be expected at other sites within Santa Catarina. Considered globally threatened (Collar *et al.* 1992, 1994).

BROWN TANAGER *Orchestiscus abeillei*

Several were seen in mixed-species flocks near Rio dos Cedros, near Blumenau, on 22 and 23 June 1998 (Denize A. Machado, LNN). Rosário (1996) listed just two previous state records, both in the extreme north; the new record provides a very slight (40 km) range extension southward. Considered near-threatened (Collar *et al.* 1994).

BLACK-BACKED TANAGER *Tangara peruviana*

Regularly recorded in the unprotected outskirts of the Carijós Ecological Reserve, in the north of Ilha de Santa Catarina since 1997, where it occupies mangrove, restinga and lowland evergreen forests (Naka & Rodrigues 2000). The species was also observed on 15 October 1998 and 17–18 July 2000 at Volta Velha, Itapoá. Given that Sick (1997) and Rosário (1996) considered it a polymorphic species, the recent view that two species are involved—*T. peruviana* and Chestnut-backed Tanager *T. preciosa* (see Sibley 1996 for rationale)—it is difficult to establish the status of *peruviana* within Santa Catarina. According to Collar *et al.* (1992), the only confirmed records for the state are those cited by Hellmayr (1936), who mentioned specimens taken at Joinville, Blumenau and Araranguá. As with Restinga Tyrannulet, many of the records mapped by Rosário (1996) in the littoral may refer to this species. Our records from Ilha de Santa Catarina represent the southernmost ever of this Brazilian endemic. Considered globally threatened (Collar *et al.* 1992, 1994).

BLACKISH-BLUE SEEDEATER *Amaurospiza moesta*

A single individual of this apparently rare and poorly known bamboo specialist was seen near Correia Pinto, on 9 May 1995 (LNN). It remained close to the ground in a small dense patch of bamboo, in second-growth *Araucaria* forest. Rosário (1996) knew of just two state records, both from the west of the state. The species is considered threatened in Brazil (Bernardes *et al.* 1990) and near-threatened globally (Collar *et al.* 1994).

Other significant state records

GREATER SHEARWATER *Puffinus gravis*

One was found dead on the north shore of Ilha de Santa Catarina, on Jurerê International beach, on 19 December 1997 (LNN). The species appears periodically along Brazilian coasts during the pre- and post-breeding periods (Sick 1997). Rosário (1996) notes only two previous state records, in February 1979 and June 1987. However, there are several other specimen records from Ilha de Santa Catarina, all retained in the UFSC collection: two were collected by T. R. de Azevedo on Pântano do Sul beach in October 1986; two were collected by S. Weiss on Campeche beach in January and April 1987 (Azevedo & Schiefler 1991), and five others were collected on Galheta, Matadeiro and Joaquina beaches in June and September 1995, 1996 and 1997 (Ferreira 1997). The reasons for such 'wrecks' among seabirds in southeast Brazil are still poorly understood, but both disease and exceptional climatic conditions have been postulated (Martuscelli *et al.* 1997).

DARK-BILLED CUCKOO *Coccyzus melacoryphus*

Single individuals were seen on Ilha de Santa Catarina, on 20 December 1997 and 6 March 1998, in second-growth forest at Canasvieiras and in restinga at Naufragados (LNN, MAGA). These are the second and third state records; the first was at Lages in November 1991 (Rosário 1996). This species is a migrant in Rio Grande do Sul, with most records from 7 October–28 February (Belton 1984).

RUSTY-BARRED OWL *Strix hylophila*

Single individuals were tape-recorded at Costa de Dentro, in the southern part of Ilha de Santa Catarina, on 7 October 1997 and 4 April 1998 (LNN). Subsequently, there have been many other aural records from different localities on the same island (MAGA), and it appears to be the most common nocturnal owl there. There are only three other recent state records, all from the Atlantic Forest region (Rosário 1996).

NACUNDA NIGHTHAWK *Podager nacunda*

One was seen over the sandy beach at Lagoa do Peri, Ilha de Santa Catarina, on 25 April 1995 (LNN). Rosário (1996) listed just one recent state record, in January 1990, at São Joaquim. The species is a summer migrant to Rio Grande do Sul from 17 August–14 May (Belton 1984).

SCALED ANTBIRD *Drymophila squamata*

One was observed by the access road to Salto do Pirai on 9 April 1997 (JMB). On 22–23 May 1998, several pairs were at Volta Velha, Itapoá (LNN, MAGA) and the species was subsequently discovered to be relatively common at this locality (JMB, DB, LNN). Bege & Marterer (1991) and Sick (1997) included it for Santa Catarina without details, although Rosário (1996) considered the species hypothetical in the state. The latter overlooked the ten specimens collected by Emil Kaempfer (held at AMNH),

at Salto Pirahy and Palmital, in 1929 (Naumburg 1939). Our records are the first dated state records since then and thus confirm its presence in the southernmost part of its range (Ridgely & Tudor 1994), where it is presumably local in foothill and lowland forests in the north of the state.

OCHRE-RUMPED ANTBIRD *Drymophila ochropyga*

One was seen briefly and its distinctive calls heard on 16 April 1997 near Urubici (JMB), as it moved through a dense understorey of shrubs and *Chusquea* bamboo in degraded upland forest. It appeared to follow a mixed flock. There were only four previous records in the state, all from the Atlantic Forest region (Rosário 1996), and this is the southernmost record of the species.

STREAK-CAPPED ANT WREN *Terenura maculata*

Five heard and seen at Salto do Pirai, on 4 October 1995, were associating with mixed-species canopy flocks within intact secondary forest (JAT), and one heard and seen at the same site, on 8 April 1997 (JMB), was also associating with a mixed-species flock. There are only two previous state records, Blumenau (Hellmayr 1924) and near Brusque in 1979 (Rosário 1996). It is probable that the species has been overlooked and is more widespread in Santa Catarina.

SOUTHERN BRISTLE-TYRANT *Phylloscartes eximius*

One was seen at Salto do Pirai, Joinville, on 29 October 1998 (GMK *et al.*). Only two localities are mentioned for Santa Catarina: Mondai, where collected in July 1928, and São Pedro de Alcântara, based on a sight record in 1991 (Rosário 1996).

OSTALET'S TYRANNULET *Phylloscartes oustaleti*

At Salto do Pirai, up to 14 birds were present on 4–5 October 1995 (JAT) and one on 29 October 1998 (GMK *et al.*). Rosário (1996) listed four previous records, two of them recent and two from the vicinity of Joinville. Our sightings confirm that the species is locally fairly common in the state's northern forests.

BROWN-BREASTED BAMBOO-TYRANT *Hemitriccus obsoletus*

One was mist-netted, tape-recorded and photographed on 7 May 1995 in second-growth *Araucaria* forest near Correia Pinto, in the south of the state (Denize A. Machado, LNN). Belton (1994) considered it fairly common in northern Rio Grande do Sul, but there are no recent records from Santa Catarina, being known in the state only from a specimen in MNRJ, taken in São Bento do Sul in 1928 (Rosário 1996).

EYE-RINGED TODY-TYRANT *Hemitriccus orbitatus*

One was seen in a patch of hillside forest on the outskirts of Joinville on 1 October 1995, and one was heard singing and observed closely at Salto do Pirai, on 5 October 1995, in riverside trees (JAT). Single individuals were seen at Volta Velha, Itapoá, on 22 April 1998 and 15 October 1998 (LNN). The first was accompanying a mixed-

species flock just below the canopy, whereas the second bird, which was tape-recorded, was perched alone at c. 6–7 m above the ground. Subsequently, the species was observed and tape-recorded in undisturbed humid forest at the same locality in mid-July 2000, and was found to be common there (JMB, DB, LNN, MAGA, ALR, CAM). The species was considered fairly common in northern Rio Grande do Sul (Belton 1994), though there is only one previous record in Santa Catarina, at Morro do Baú (Rosário 1996). Nevertheless, *Idioptilon orbitatum* had been included, without further details, in a previous state list (Bege & Marterer 1991).

SULPHUR-RUMPED FLYCATCHER *Myiobius barbatus*

Six sightings, involving at least three birds at Salto do Pirai on 5 October 1995 (JAT) were in streamside secondary forest undergrowth. On 22 April 1998, one was observed foraging low down within a mixed-species flock at Volta Velha, Itapoá (LNN). These appear to be the second and third state records, the first being a specimen from Joinville in 1928 (Rosário 1996).

FLAME-CRESTED TANAGER *Tachyphonus cristatus*

Three on 8 April 1997 and two on 9 April 1997 at Salto do Pirai (JMB) were all with mixed-species flocks. A pair with one young being fed by the female was at Volta Velha, Itapoá, on 15 October 1998 (LNN, MAGA), and up to five were seen in this reserve on 15–18 July 2000 (JMB, DB, LNN, MAGA, ALR, CAM). These records represent the second to fourth state records (Rosário 1996) and the southernmost for the species.

BRAZILIAN TANAGER *Rhamphocelus bresilius*

Several were seen on 10 December 1997 on Ilha Campeche, off the east coast of Ilha de Santa Catarina. There are also records from Ilha de Santa Catarina, in October 1997 (ALR pers. comm.). These appear to be the southernmost records of the species. Its rarity in the state may be a consequence of the pet trade or it may be that it is naturally less common at the extremity of its range. Just three recent records, and all others with the exception of one, in 1936, at Camboriú, are from the northernmost part of the state, near the Paraná border.

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The occurrence of Red Knots *Calidris canutus* on the north-central coast of Brazil

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The Red Knot *Calidris canutus* has received a great deal of attention from researchers all over the World. This species breeds at high latitudes in the Arctic tundra and undertakes long migrations to winter in the south, in both temperate and tropical coastal areas (Morrison 1984, Piersma & Davidson 1992).

The wintering areas of *C. c. rufa* in southern South America (54° S) are relatively well documented (Harrington & Morrison 1980, Morrison & Ross 1989, Baker *et al.* 1995). However, little is known about the occurrence of the species on the northern coast of Brazil, with the exception of aerial surveys led by Morrison & Ross (1989). During these flights, flocks totalling 8,150 Red Knots were tentatively identified on the north-central coast of Brazil (sectors 51 and 59, Morrison & Ross 1989). According to these authors, these sightings represent the largest concentrations of the species in South America outside its principal wintering areas in Patagonia and Tierra del Fuego.

There is only one report of brief (two months) land-based studies on Red Knots on the north-central coast of Brazil (Wilson *et al.* 1998), and little information is

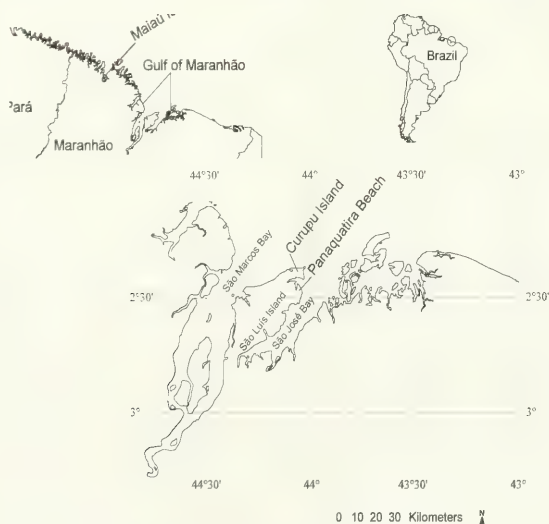


Fig. 1. Map of the study area, showing the location of the study sites at Panaquatira Beach and Curupu Island.

available from other parts of the year from this region. The present study provides data on the number of Red Knots, and their biometry, moult, food and body mass, and provides a better understanding of the role of coastal areas of northern Brazil in the long-distance migrations of this species.

Study area

Observations were made at two study areas, Curupu Island and Panaquatira Beach, both in the Gulf of Maranhão (02° 28' S, 44° 00' W), in São José Bay at the eastern extreme of São Luís Island (Fig. 1). The whole region is within a wide estuarine area created by the mixture of the salty waters of the Atlantic Ocean with the fresh waters from the Itapecuru, Mearim and Pindaré rivers. Maximum tidal amplitude in this coastal sector can reach 8 m (Mabesoone & Coutinho 1970).

The landscape of the north-central coast of Brazil differs completely from the northernmost portions of South America because it is deeply indented, presenting a series of sand banks separating shallow bays (Morrison *et al.* 1987, Morrison & Ross 1989). A progressive transition from coarse sediments along the outer coastlines to fine sediments in the inner bays produces a wide variety of habitats, reflected in the impressive numbers of shorebirds using the coast (Morrison & Ross 1989, Rodrigues & Roth 1990, Rodrigues 1993). In May 1993, this area was recognized as a "hemispheric site" by the Western Hemisphere Shorebird Reserve Network.

Methods

Intermittent expeditions to the study area have been carried out since 1992, providing some qualitative data used here. Expeditions to Curupu Island, which corresponds to Morrison & Ross's (1989) sector 59, were carried out between January and March 1997. Panaquatira Beach, approximately 4 km south of Curupu, was visited monthly between July 1996 and May 1997. Counts were carried out on Curupu Island and Panaquatira Beach at high tide and during the ebb tide. All observations were carried out using 10 x 50 binoculars and a 15-60 x telescope. Special efforts were made to scan migratory flocks of Red Knots to look for colour-marked birds ringed elsewhere.

Some birds were mist-netted at night at Panaquatira Beach. Each bird received a CEMAVE (Centro de Pesquisas para a Conservação das Aves Silvestres-IBAMA, Brazil) metal ring and some received colour rings. Wing length (maximum chord) (Evans 1964) was measured to the nearest mm. Bill was measured to the nearest 0.1 mm from the tip of the upper mandible to the feather-margin. Body mass was obtained using 300g Pesola balances, and the birds were also examined for moult (see Prater *et al.* 1977, Hayman *et al.* 1986). Values presented are means $\pm$ SD. We used one way ANOVA to compare mean body mass between months.

The densities of the benthic fauna in Red Knot feeding areas were analysed via sediment samples collected in December 1996 (Panaquatira Beach) and in February 1997 (Curupu Bay). The samples were collected using a PVC cylinder 110 cm long and 10 cm in diameter (Rebello, 1986). Fifteen cores, representing a total area of

0.15 m², were taken at each study site. The benthic organisms were sorted in the field using sieves with overlapping meshes of 1.0 mm and 0.5 mm. The collected material were anaesthetised with MgCl₂, fixed in 10% formaldehyde, and subsequently conserved in 70% alcohol for identification. The stomach contents of a Red Knot which died during a ringing expedition in April 1996 were also analysed.

The length (to the nearest 0.1 mm) of bivalve molluscs was measured from the widest point of the anterior region to the widest point of the posterior region (Rios 1975) using calipers.

Results

Bill lengths of Red Knots from mixed sex samples caught in Panaquatira Beach ($\bar{x} = 35.6 \pm 2.2$, $n = 60$, Table 1), do not differ from populations passing through or wintering in other parts of South America (Surinam $\bar{x} = 35.6 \pm 1.68$, $n = 35$; southern Brazil $\bar{x} = 35.9 \pm 2.15$, $n = 20$ and Argentina $\bar{x} = 36.2 \pm 1.92$, $n = 273$ – see Morrison & Harrington 1992: table 2), although there appear to be two main groups wintering in South America.

Red Knots use this stretch of the north-central coast of Brazil throughout the year and winter in concentrations of up to 1,000 individuals (Fig. 2). One bird banded at Panaquatira Beach as a juvenile in April 1996 was recaptured at the same site in early May 1997. During autumn migration, numbers varied, presumably due to the movements of recently-arrived individuals (Fig. 2). During spring migration, numbers decreased from February to May in the Gulf of Maranhão (Fig. 2), suggesting that some birds move to more northerly areas, probably to Maiaú Island in the west coast of Maranhão (*c.* 170 km distant – where Wilson *et al.* (1998) recorded 355 birds in early May), to accumulate fat reserves before the next stage of the flight. However, some individuals were observed at the end of April and early May in breeding plumage in the Gulf of Maranhão.

Two roosting areas used by Red Knots during high tide were identified (Fig. 1). The first, on Curupu Island, had the greatest observed wintering concentrations of

TABLE 1.
Measurements (mm) and body mass (g) of Red Knots caught on Panaquatira Beach, Maranhão, Brazil

Date	Wing $\bar{x} \pm \text{SD}$	Bill $\bar{x} \pm \text{SD}$	Tarsus $\bar{x} \pm \text{SD}$	Mass $\bar{x} \pm \text{SD}$
16 December 1993 ($n = 5$)	169.8 $\pm$ 5.4	36.0 $\pm$ 1.1	33.0 $\pm$ 2.1	109.2 $\pm$ 7.3
08 September 1996 ($n = 4$)	168.2 $\pm$ 6.6	36.6 $\pm$ 1.5	33.3 $\pm$ 0.8	106.5 $\pm$ 11.2
14 April 1996 ($n = 9$)	168.8 $\pm$ 4.7	33.4 $\pm$ 3.0	32.1 $\pm$ 1.7	120.1 $\pm$ 14.8
27 April 1996 ($n = 4$)	168.5 $\pm$ 3.1	35.8 $\pm$ 0.9	32.7 $\pm$ 1.7	136.7 $\pm$ 13.3
29 March 1997 ($n = 15$)	163.5 $\pm$ 5.8	36.1 $\pm$ 2.3	33.7 $\pm$ 2.6	118.9 $\pm$ 9.0
12 April 1997 ($n = 5$)	166.6 $\pm$ 5.1	36.4 $\pm$ 1.3	33.0 $\pm$ 1.2	113.0 $\pm$ 3.9
05 May 1997 ($n = 18$)	165.0 $\pm$ 4.3	36.4 $\pm$ 1.4	33.0 $\pm$ 1.1	142.1 $\pm$ 8.7

individuals (1,200); Knots were generally associated with Short-billed Dowitcher *Limnodromus griseus*, Black-bellied Plover *Pluvialis squatarola*, Ruddy Turnstone *Arenaria interpres*, Sanderling *Calidris alba*, Semipalmated Sandpiper *C. pusilla* and Semipalmated Plover *Charadrius semipalmatus*. The greatest concentration of individuals observed at the second area, on Panaquatira Beach, was 800. If these two records represent separate waves, the total number of Red Knots wintering in this sector of the coast may reach 2,000.

Moult schedule

Five adult Red Knots caught in October 1995 and September 1996 had wing moult (primaries 4, 5, 6 and 7). In December 1993, two adults had completed primary moult and three were moulting primary 10, suggesting that this was towards the end of the moulting process. Two individuals were moulting tail feather number 1 in September 1996, whereas none were in moult in December 1993. No birds captured in April 1996 ($n = 13$), March, April and May 1997 ($n = 38$) were moulting remiges or rectrices.

Body moult into winter plumage was observed in October 1995 and September 1996, but not in December 1993. In April 1996 and 1997, and May 1997, body moult into breeding plumage was accentuated once again.

Body mass

Differences in mean body masses of Knots captured on Panaquatira Beach at different seasons were statistically significant ($F_{6,53} = 2.275$, $P < 0.05$). On the basis of McNeil & Cadieux's (1972) formula for estimating flight range, and using Antas & Nascimento's (1996) modified value for flight velocity of 60 kph, the mean body mass at the end of April and early May ($\bar{x} = 135$ g, range = 107-162 g, $n=23$) was below the expected departure mass required to reach eastern North America.

Feeding areas

At the beginning of the ebb tide, when the intertidal zone is uncovered, flocks of Red Knots were observed moving from their roosting areas on Curupu Island to the feeding areas on the sandy mud in Curupu Bay. Up to 600 Knots were seen foraging in this sector, associated with a few Short-billed Dowitchers. The sediment samples revealed the almost exclusive presence of the bivalve mollusc *Anomalocardia brasiliiana* ($2.5/\text{m}^2$; $n = 38$). Despite the variation observed in the size of *A. brasiliiana* (1.8-34.0 mm), only individuals between 1.9-2.0 mm and 5.0-7.0 mm ($n = 20$) were found in the Red Knot stomach contents.

Small groups of 10 to 50 Red Knots were observed foraging along a stretch of 2 km at certain points along the inner margins of Curupu Bay. The presence at these sites of the mollusc *Mytella falcata* is clearly indicated by the fact that local fishermen were observed collecting the species for consumption.

Discussion

Occurrence and migration

The available data indicate that the current wintering population of Red Knots in sector 59 of Morrison & Ross (1989) may reach 2,000 individuals, somewhat less than the 3,000 individuals counted during their aerial survey of January 1986. Concentrations of 5,000 individuals, tentatively identified as Red Knots, in Cabelo da Velha Bay on the west coast of Maranhão state (sector 51, Morrison & Ross 1989) emphasize the importance of the north-central coast of Brazil as a wintering area. The records 7,000-8,000 Knots on the north-central coast of Brazil represents around 10% of the South American counts, which held 76,400 (Morrison & Ross 1989).

There is a record of the occurrence on the western coast of Maranhão, on 18 May 1987, of a Red Knot ringed at Lagoa do Peixe in southern Brazil (Morrison & Harrington 1992). At Maiaú Island, the western coast of Maranhão State, we observed on 30 April 1997, during northward migration, one bird with an orange flag which had been marked in Argentina. These data indicate that populations which winter in southern South America use the north-central coast of Brazil as an area for refuelling and moulting prior to making for the next known stopping point on Delaware Bay, eastern United States. One bird seen at Panaquatira Beach on 12 May 1997, had a green flag on the left tibia indicating that it had been ringed in U.S.A.

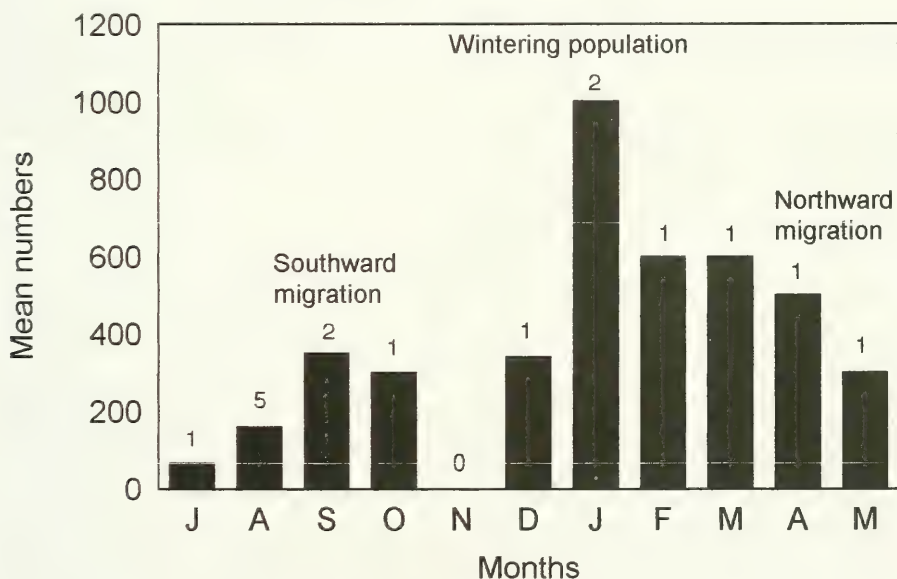


Fig. 2. Seasonal variation in the numbers of Red Knots on Panaquatira Beach and Curupu Island, Maranhão, Brazil, from July 1996 to May 1997. The numbers at the top of the columns show the number of counts on which each datum is based.

According to Morrison & Harrington (1992), during northward migration at the Lagoa do Peixe, predicted flight ranges are more than adequate for the birds to reach north-central Brazil (3,300 km) but not adequate for a direct flight to the United States (8,700 km). Red Knots from southern South America probably encounter the wintering individuals on the north-central coast of Brazil during their spring migration, which makes the separation of these populations somewhat difficult, given that both are found in their breeding plumage.

The census data indicate a small peak in numbers during the autumn, which is due to the arrival of wintering individuals on the north-central coast of Brazil, in addition to the transit of part of the population of Red Knots that winters in southern South America. At Panaquatira Beach we observed in September 1996 and August and September 1999 three Knots with orange flags indicating that they had been ringed in Argentina.

Moult

According to Morrison & Harrington (1992) body moult into breeding plumage starts on the wintering ground. In March, the majority of wintering Red Knots at Panaquatira Beach still bore winter plumage, and the reddish breast characteristic of the breeding plumage was seen in only three individuals. Of the 18 birds captured there in early May 1997, a third were still actively body moulting into breeding plumage whereas the remainder had completed moult, with breeding plumage characteristics between 70-90% (Wilson *et al.* 1998, suggest that some of these birds were probably second year). Thus the pattern observed at Panaquatira Beach is quite different from that recorded at Lagoa do Peixe in southern Brazil, where the full breeding plumage was attained during the first two weeks of April for most of the population (Antas & Nascimento 1996). These differences are probably related with the distances to be travelled by the birds from different wintering areas.

Body mass

The overall journey of 5,000 km between the north-central coast of Brazil and the next known stop in Delaware Bay would take some 3 days of flying at a speed of 60 km/h (Antas & Nascimento 1996: table 2). Forty-five Red Knots, caught by CEMAVE-IBAMA on Maiaú Island, had an average mass of 160 g (range 120-210 g). Masses around 200g are similar to records of departure mass, from other stopover areas where birds initiate long flights (Wilson & Morrison 1992, Davidson & Wilson 1992, Piersma *et al.* 1992) and are more than sufficient to fly non-stop over the Atlantic Ocean to reach Delaware Bay (on the basis of McNeil & Cadieux's 1972 formula). Although the mean mass of the birds captured in mid April and early May 1997 on Panaquatira Beach was below an expected departure mass of around 200 g, the peak number for Red Knots in Delaware Bay is between 26-30 May (Clark *et al.* 1993). Thus it is possible that most birds remain in the area for at least two more weeks to build up adequate fat reserves. We suggest that probably at least some of the birds

banded in Panaquaira Beach were migrating this distance because one of the seven knots banded at Salinas Beach (00°30' S; 47°20' W – north-central coast of Brazil), Pará State, on 12 April 1997 was recaptured in Delaware Bay at the end of May (A. J. Baker, pers. comm.). When initially captured in Salinas Beach, these knots apparently did not have sufficient fat reserves ($\bar{x}$ = 105.8 g, range 90–115 g, n = 7) to fly 5,000 km. These masses are similar to those recorded in Panaquatira Beach at the same date (12 April 1997). Thus, the birds probably remained on the area long enough to accumulate sufficient fat reserves. There are some records of Knots putting on mass at 2 g to 3 g per day, and exceptionally 8 g per day (see Evans 1992). At 3 g per day a 115 g Knot caught on 12 April would be 205 g on 12 May. The heaviest Knot caught in Panaquatira Beach was 162 g on 5 May. At 3 g per day this would have reached 205 g by 20 May. Alternatively, some birds may leave the north-central coast of Brazil with departure mass less than 200 g.

A comparison of the spring census data from Maranhão with those collected by Spaans (1978) in Surinam suggests that Red Knots may use a wide area of the northern coast of South America, migrating north from a number of different points (Rodrigues, unpublished data).

Threats to feeding sites

Roosting areas in Curupu Island are still relatively well protected and no obvious threat was identified during the present study. However, in the feeding areas, local fishermen collect large quantities of the molluscs *A. brasiliiana* and *M. falcata*, both for their own consumption and for sale in local markets (Mendes & Branco 1981). Preliminary data indicate that *A. brasiliiana* is one of the principal components of the diet of Red Knots on this sector of the coast. While the shell length of the molluscs collected by local fishermen (24–35 mm, n = 30) is larger than those taken by Red Knots (1.9–7.0 mm, n = 20), the principal threat is the over-exploitation of the adult molluscs, which would lead to a depletion of food stocks for the birds in this area. On Panaquatira Beach, the most frequent disturbance is the movement of people and vehicles, which is particularly intense during weekends, resulting in the displacement of the birds.

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The first record of a Short-tailed Shearwater *Puffinus tenuirostris* for the Mascarene Islands

by D. S. Smith & A. S. Cheke

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The Short-tailed Shearwater *Puffinus tenuirostris* breeds on mainland Australia and the Tasmanian Islands. Most migrate during the non-breeding season to the north Pacific, but there is evidence of some appearing in the northern Indian Ocean between Oman and the Malay Peninsula, possibly displaced by storms (Frith 1978, Colston 1980, Marchant & Higgins 1990). We report here the first record of the species for the Mascarene Islands, south-west Indian Ocean. The bird was found by local people alive on the beach at Riviere Coco, Rodrigues on 5 June 1974. It died shortly afterwards and its remains were passed to ASC on his next visit to the island on 12 July. They were subsequently deposited in The Natural History Museum, Tring, where they are now preserved in the bird skin collection (BMNH reg. no. 1999.30.1.)

Initial identification of the specimen as *P. tenuirostris* has now been confirmed by comparison with skins of this and related species. In particular it is clearly distinguishable from the Sooty Shearwater *Puffinus griseus*, the most similar species, in having a shorter, stubbier bill and a pale grey underwing. The following measurements (mm) taken from the carcass are also consistent with other *P. tenuirostris* skins: wing 265, tarsus 51, bill 32, middle toe and claw 62. The only other evidence of the occurrence of the species in the south-west Indian Ocean appears to be a recent sight record off the south east coast of South Africa, reported without supporting details by Enticott & Tipling (1997).

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The nest and eggs of *Merops muelleri mentalis*

by R. J. Dowsett

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Carter & Dickerman (1998) write that their description of the nest and eggs of *Merops muelleri* is the first for the Upper Guinea subspecies *mentalis*. This is not so, because the nest and eggs described by Serle (1954, p. 56) were of this form. It is generally accepted that the division between *mentalis* and the nominate is in SW Cameroon, and not as one might suppose west of the Dahomey Gap. Serle himself looked carefully at specimens before coming to this conclusion (1950, p. 360). This is one of several Upper Guinea birds which has its eastern distribution delimited by the Sanaga river system. But the nest that Carter & Dickerman report from Liberia does seem to be the only one described from Upper Guinea proper.

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The supposed significance of originally capitalized species-group names

by Normand David & Michel Gosselin

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The increasing number of publications on birds, including numerous handbooks and checklists, brings to light how useful standard zoological nomenclature can be in making sense out of a diversity of taxonomies and classifications. The authors of some of these recent compendia (e.g. Sibley & Monroe 1990, Andrew 1992, Dowsett & Dowsett-Lemaire 1993, Christidis & Boles 1994, Inskipp *et al.* 1996) have occasionally commented on the correct use and spelling of scientific names. One of the most puzzling statements in this respect was made repeatedly by Sibley & Monroe (1990: 88, 537), to the effect that capitalization of original species-group names indicated nouns in apposition, and that the ending of such names should therefore always remain unchanged. We believe that this statement by Sibley & Monroe originates from a similar claim made by Parkes (1982), who was careful, however, to apply it only to Linnaeus.

Tringa Fulicaria Linnaeus, 1758, has been known for the better part of the last 150 years as *Phalaropus fulicarius* or *Crymophilus fulicarius* (e.g. Sharpe 1896, AOU 1957, Voous 1973). Yet, Parkes (1982), quoting Oberholser (1974), has argued that Linnaeus, in using a capital initial letter, had intended to regard *Fulicaria* as a noun, and that, therefore, the correct spelling of the name should be "*Phalaropus fulicaria*". This practice has since been followed by some authors (e.g. AOU 1983, Sibley & Monroe 1990, del Hoyo *et al.* 1996), but not by others, who have continued to use *Phalaropus fulicarius* (Urban *et al.* 1986, BOU 1992, Dowsett & Dowsett-Lemaire 1993, Howard & Moore 1994, Higgins & Davies 1996, Snow & Perrins 1998).

Although it is true that Linnaeus capitalized most of the species-group names that he used as nouns, some of these capitalized names are adjectives nevertheless. Examples from among his Aves include:

- *Pelecanus Aquilus* Linnaeus, 1758 [now *Fregata aquila* —see below];
- *Pelecanus Bassanus* Linnaeus, 1758 [now *Morus bassanus* or *Sula bassana*];
- *Cancroma Cochlearia* Linnaeus, 1758 [now *Cochlearius cochlearius* —see below];
- *Anas Albeola* Linnaeus, 1758 [now *Bucephala albeola*];
- *Tringa Hypoleucos* Linnaeus, 1758 (a Greek adjective).

On the other hand, Linnaeus printed without a capital initial letter some species-group names that are nouns, and not adjectives, e.g.:

- *Tetrao umbellus* Linnaeus, 1766 [now *Bonasa umbellus* —see below];
- *Psittacus erithacus* Linnaeus, 1758 (see below);
- *Alcedo erithaca* Linnaeus, 1758 [*Alcedo Erithaca* in Linnaeus, 1766] (see below);
- *Turdus atricapilla* Linnaeus, 1766 (see below).

The International Code of Zoological Nomenclature is silent regarding the supposed significance of originally capitalized species-group names, only prescribing that “the initial letter must be replaced with a lower case letter” (ICZN 1999: Art. 32.5.2.5).

In the works of Linnaeus, as in those of any other author, the nature of Latin words must be determined from Latin dictionaries, and other relevant sources when necessary. Inconsistencies in the use of typeface do not override Latin, the assumption of which is one of the basic tenets of the Code (ICZN 1999, Art. 11.3, Glossary p. 107).

Linnaeus’ upper cases may have relevance in indicating a noun when they are applied to a word that can be regarded as either a noun or an adjective (ICZN 1999, Art. 31.2.2). For example, in *Lanius Garrulus* Linnaeus, 1758 [now *Bombycilla garrulus*], and in *Psittacus garrulus* Linnaeus, 1758 [now *Domicella garrula* (in Wolters 1982) or *Lorius garrulus* (in del Hoyo *et al.* 1997)], the Latin word *garrulus* can be either a noun [chatterer] or an adjective [garrulous]. Here, the presence of an upper or a lower case, in conjunction with the original diagnosis and the sources quoted by Linnaeus, can be invoked to show a distinction between these two meanings (Newton, in Parkes 1958).

***Tringa Fulicaria* Linnaeus, 1758**

In *Tringa Fulicaria* Linnaeus, 1758, *Fulicaria* is the word *fulica* [coot], to which was added the Latin adjectival suffix *-aria* [belonging, or related to] (Woods 1944: XII); this is in reference to the coot-like feet of the Red Coot-footed *Tringa* [of Edwards 1743], quoted by Linnaeus as the source for his species. No one has ever questioned Linnaeus’ intention to use Latin, and *-arius*, *-aria*, *-arium* are indisputable Latin adjectival suffixes indicating attribution or relatedness (Woods 1944, Brown 1978). In a similar fashion, *Corvus Graculinus* White, 1790, and *Crypturus perdicarius* Kittlitz, 1830, are now known respectively as *Strepera graculina* and *Nothoprocta perdicaria* (see Peters 1962, 1979). The former specific name is composed of the Latin noun *graculus* [jackdaw] and of the adjectival suffix *-inus*, *-ina*, *-inum* [having the properties of], and the latter comes from *perdix*, *-icis* [partridge], followed by *-arius*, *-aria*, *-arium* [related to] (Woods 1944). The new derived words are adjectival species-group names, the ending of which “must agree in gender with the generic name with which they are at any time combined” (ICZN 1999, Art. 34.2).

“Where the author of a species-group name did not indicate whether he or she regarded it as a noun or as an adjective, and where it may be regarded as either and the evidence of usage is not decisive, it is to be treated as a noun in apposition to the name of its genus” [ICZN 1999, Art. 31.2.2 —italics ours]. Neither of these two conditions applies in the case of *Tringa Fulicaria*, let alone both of them. The word *fulicaria* is not a Latin noun, but an adjectival name, and therefore the current correct spelling for *Tringa Fulicaria* Linnaeus, 1758, is indeed *Phalaropus fulicarius*, as mandated by Art. 34.2 of the ICZN Code (1999).

Because the capital initial letter is the only argument put forward by Parkes (1982) for regarding *Fulicaria* as a noun, it is important to note that Linnaeus printed *fulicaria* with a lower case in the 1766 edition of his *Systema Naturae*.

***Cancroma Cochlearia* Linnaeus, 1766**

In a similar vein, the correct current combination for *Cancroma Cochlearia* Linnaeus, 1766, is *Cochlearius cochlearius* (as per Peters 1979, AOU 1983, del Hoyo *et al.* 1992), even though Sibley & Monroe (1993: 44) have advocated the use of “*Cochlearius cochlearia*”, apparently arguing again that capitalization of the original species-group name indicated a noun in apposition. In this case, however, the claim of Sibley & Monroe has been ignored by subsequent authors, such as Howell & Webb (1995) and the AOU (1998). Here, the Latin neuter noun *cochlear* [spoon] is followed by the adjectival suffix *-ius*, *-ia*, *-ium* (Woods 1944), therefore meaning “spooned”.

***Pelecanus Aquilus* Linnaeus, 1758, and *Tetrao umbellus* Linnaeus, 1766**

Pelecanus Aquilus Linnaeus, 1758, and *Tetrao umbellus* Linnaeus, 1766, are instructive for our purpose. In *Pelecanus Aquilus*, Linnaeus has used the classical Latin adjective *aquilus* [dark-coloured], not the Latin noun *aquila* [eagle] (Lewis 1879); consequently, subsequent authors have used the combination *Fregata aquila* (i.e. the feminine of *aquilus*). On the other hand, there is no such Latin word as *umbellus*, but *umbella* is a classical Latin noun, meaning umbrella or parasol (Coues 1903: 741, Jobling 1991). Although Linnaeus has altered its termination (and gender), *umbellus* is not a Latin adjective, and has none of the attributes of a Latin adjective; it must therefore be treated as a noun and remain unchanged when combined with the feminine genus *Bonasa* (as per ICZN 1999, Art. 31.2.1, 31.2.2). Treating *umbellus* as a wholly new word that is neither Latin nor latinized would also make it invariable (ICZN 1999, Art. 31.2.3). Whether or not Linnaeus had meant to use *umbellus* as an adjective in combination with the masculine noun *Tetrao* (see Coues 1903: 741) is irrelevant under the present ICZN Code, since it is not a Latin adjective. Therefore, subsequent authors have always used the combination *Bonasa umbellus*, and rightly so.

As in most other cases, the presence of a capital initial letter in *Aquilus*, and its absence in *umbellus* have no bearing on the real nature of these words.

***Alcedo erithaca* Linnaeus, 1758**

The word *erithacus* is a classical Latin noun (Lewis 1879), usually associated with the Robin (*Erithacus rubecula*), the Redstart (*Phoenicurus phoenicurus*), or some sort of mimetic bird (Jobling 1991). Linnaeus (1758, 1766) used an upper case in the combination *Motacilla Erithacus* (= *Phoenicurus phoenicurus*), and a lower case in the combination *Psittacus erithacus* (the Grey Parrot, a red-tailed bird like the Redstart). In both combinations, the species-group name *erithacus* is a Latin noun

and its ending “must not be changed to agree in gender with the generic name [Art. 31.2.1]” (ICZN 1999, Art. 34.2.1).

In the combination *Alcedo erithaca* Linnaeus, 1758 [printed *Alcedo Erithaca* by Linnaeus in 1766], the name *erithaca* is a neologism derived from a noun (like *umbellus* from *umbella*, quoted above); it is not a Latin adjective nor an adjectival form, and shall thus remain unchanged (as per ICZN 1999, Art. 31.2.1, 31.2.2, 31.2.3, 32.3). Consequently, the current correct spelling for *Alcedo erithaca* Linnaeus, 1758 is *Ceyx erithaca*, and not “*Ceyx erithacus*” as was used by Peters (1945), Sibley & Monroe (1990), etc.

***Turdus atricapilla* Linnaeus, 1766**

The word *atricapilla* is a classical Latin noun for a bird [generally identified as the Blackcap, *Sylvia atricapilla*] and the feminine form of the classical Latin adjective *atricapillus* [black-haired] (Lewis 1879). The fact that Linnaeus has used *atricapilla* in apposition to the masculine genus *Turdus* indicates that the word can only be a noun, not an adjective — which would have been *atricapillus* in this case, as all adjectives used by Linnaeus in combination with *Turdus* are masculine (*plumbeus*, *roseus*, *cafer*, *dominicus*, etc.). Therefore, the correct current spelling for *Turdus atricapilla* Linnaeus, 1766, is *Donacobius atricapilla*, and not “*Donacobius atricapillus*” as was used by Peters (1960), Sibley & Monroe (1990), etc.

Discussion

The use of capital letters in ornithological works of the 18th and 19th Centuries was uneven, to say the least. Many adjectival species-group names were commonly spelled with an initial upper case, some typesetters even making a practice of it. Random examples taken from Peters’ *Check-list of birds of the world* (1934-1986) include:

Colymbus Stellatus Pontoppidan, 1763 [now *Gavia stellata*];
Charadrius Dominicus Müller, 1776 [now *Pluvialis dominica*];
Paradisaea Magnifica Pennant, 1781 [now *Cicinnurus magnificus*];
Motacilla Galeata Boddaert, 1783 [now *Lophotriccus galeatus*];
S[faltator] Flavus Vieillot, 1822 [now *Piranga flava*];
Fringilla Agilis Tickell, 1833 [now *Dicaeum agile*].

Some early authors may have had their own logic in the use of typeface, but the provisions of the ICZN Code (1999) now prevail.

In the works of Linnaeus, as well as in those of any other author, the use of upper or lower cases in species-group names has no significance in itself, and may have relevance only in the few situations where two meanings might be involved. Such situations must be evaluated on an *ad hoc* basis, and the upper case alone cannot be invoked as an indication that we are dealing with a noun. Otherwise, anyone advocating the use of “*Phalaropus fulicaria*”, based solely on the presence of a capital initial letter in Linnaeus (1758), should also advocate the use of “*Fregata aquilus*”, “*Bonasa umbella*”, etc.

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New records of birds from the island of Panay, Philippines

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Dickinson *et al.* (1991) summarized the ornithological history of the island of Panay in the central Philippines and included all known published records of birds from there prior to 1990. Although Sonnerat (1776) first collected on the island in 1771 or 1772, more than a century passed before major collections were made by the Steere Expeditions in December 1874 (Sharpe 1876, 1877) and January 1888 (Steere 1890), and by the Menage Expedition (Bourns and Worcester 1894) in November 1890. Until recently, these expeditions formed the foundation of ornithological knowledge of the island.

During the early part of the 20th century, naturalists neglected Panay, possibly because the lowland forests had already been extensively denuded and the mountain range running along the west coast was not easily accessible. Also, they may have felt the mountains not sufficiently high (the highest peak, Mt Madja-as is 2,117 m) nor extensive to support an unique montane fauna. Simply, the likelihood of finding "ornithological novelties" on the island seemed to be very low.

Fortunately, in February and March 1987, R. Cox and Sison set out to survey the remaining forests of the western mountain range for the endangered Visayan Spotted Deer *Cervus alfredi*. They focused on Mt Baloy (1,910 m), which lies at the junction of the provinces of Antique, Iloilo and Capiz. During this survey, Sison collected 77 bird specimens as well as several hundred mammals, reptiles and amphibians. Among the specimens were a number of new records for Panay, as well as an unidentified babbler and an unidentified large rodent which have since been described as new

species, the Panay Striped-Babbler *Stachyris latistriata* (Gonzales & Kennedy 1990) and the Panay Cloudbird *Crateromys heaneyi* (Gonzales & Kennedy 1996).

Prompted by the important discoveries of the 1987 survey, Gonzales and Kennedy formed the National Museum of the Philippines/Cincinnati Museum of Natural History (NMP/CMNH) Philippine Biodiversity Inventory (PBI). In September and October 1989, the PBI team conducted a new survey of Mt Baloy. Later in April and May 1992, the PBI team surveyed Mt Madja-as, about 27.5 km north-northwest of Mt Baloy and in the same mountain range.

Here we report 37 new records of birds for Panay obtained during the 1987, 1989 and 1992 surveys, as well as incidental surveys conducted in other areas of Panay between 1987 and 1993. One of these records is from previously unreported specimens in the Delaware Museum of Natural History (DMNH).

Location data

Below, we summarize the key areas surveyed during our work (see Fig. 1). In the species accounts that follow, we will refer to the abbreviated title for each location.

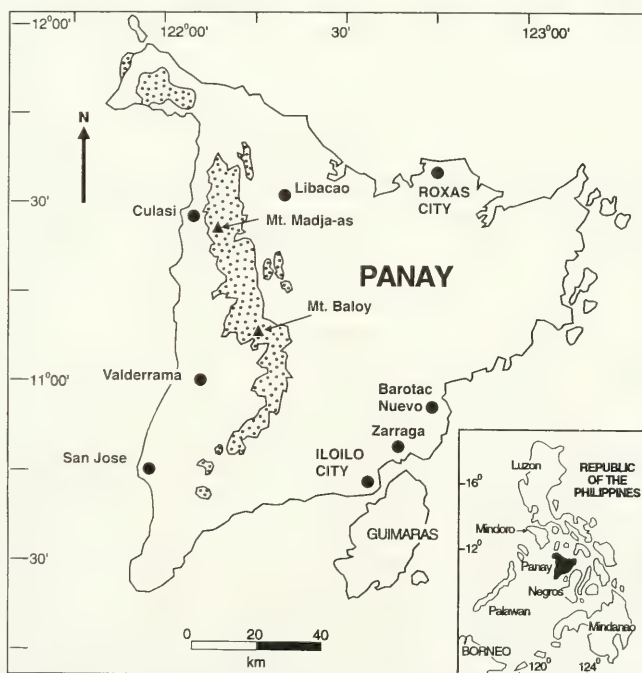


Figure 1. Map of Panay, Philippines showing the location of municipalities and mountains mentioned in the text and the distribution of the closed and open canopy forest remaining on the island (stippled).

- Mt Baloy, 1987* - Mt Baloy, Iloilo Province 900 to 1,200 m elevation, mid-mountain forest; 12 February to 7 March 1987.
- Mt Baloy, Camp 1* - 11°06'N, 122°12'E, along the Cadian River, Sitio Tinogyan, Barangay San Agustin, Municipality of Valderrama, Antique Province, 160 to 210 m, mixed grassland and remnant patches of lowland forest; 1 to 5 October 1989.
- Mt Baloy, Camp 2* - 11°08'N, 122°14'E, 1.1 km south southwest of the peak of Mt Baloy, Barangay San Agustin, Municipality of Valderrama, Antique Province, 1,430 to 1,540 m, montane mossy forest; 7 to 14 October 1989.
- Mt Baloy, Camp 3* - 11°07'N, 122°13'E, 4.2 km southwest of the peak of Mt Baloy, Barangay San Agustin, Municipality of Valderrama, Antique Province, 770 to 975 m, mid-mountain forest and grasslands mixed with remnant patches of forest; 14 to 17 October 1989.
- Hanggud Tubig, Mt Madja-as* - 11°23'N, 122°09'E, west face of Mt Madja-as, locally known as Hanggud Tubig, Barangay Alojipan, Municipality of Culasi, Antique Province, 990 to 1,350 m, mid-mountain to montane mossy forest; 4 to 13 April 1992.
- Nalanaw, Mt Madja-as* - 11°24'N, 122°09'E, northwest ridge approach to Mt Madja-as, locally known as Nalanaw, Municipality of Libacao, Aklan Province, 1,330 to 1,570 m, montane mossy forest with upper level dominated by palm and *Pandanus* sp.; 19 to 26 April 1992.
- Alojipan, Department of the Environment and Natural Resources (DENR) Nursery* - 11°25'N, 122°07'E, located in the western foothills of Mt Madja-as, Barangay Alojipan, Municipality of Culasi, Antique Province, 60 to 130 m, tree (*Gmelina* sp.) plantation and mixed second growth; 28 April to 2 May 1992.
- Barotac Nuevo* - Shallow fish ponds near Iloilo State College of Fisheries, Barangay Tiwi, Municipality of Barotac Nuevo, Iloilo Province, near sea level; 28 February 1993.

Species accounts

In the following accounts, records may be sight records or specimen records or a combination of both. We have included sight records only where the species was identified by one or more competent observers at close range with good optical equipment and lighting conditions, and could be identified without question based on size, field marks, habitat and behaviour. Species and number of specimens collected during the NMP/CMNH surveys follow the guidelines outlined in Gratuitous and CITES Permits issued by the Protected Areas and Wildlife Bureau of the Philippine Department of Environment and Natural Resources. For the specimen records, we refer to the museum catalogue number of each specimen when the species is either rare or if only a few specimens were obtained. For more common species, we mention only the museum where the voucher specimens are located. Where possible, we have identified each species to subspecies but it is clear that many of these new records also represent new subspecies that we will describe elsewhere. For the most part, we

have used Dickinson *et al.* (1991) as our source for English and scientific names, and for the former known distribution of the species and subspecies mentioned in this report.

Finally, in the field we recorded the altitude for most specimens obtained. On Mt Madja-as, we established 2 non-contiguous altitudinal transects, 1 at Hanggud Tubig with 50 mist nets and 1 at Nalanaw with 39 nets. Combined, the nets ranged from 988 m to 1,570 m, and overlapped only between 1,330 and 1,350 m. At both sites, all nets were opened for approximately 7 full days. This allowed us to compare the number of specimens captured per mist net (capture/mist net ratio) at different altitudes for the more common species.

GREAT EGRET *Egretta alba modesta*

Kennedy and Ebreo observed 6 on 12 October 1989 along the National Highway foraging in and flying over ricefields a few km north of San Jose, Antique Province near sea level. They identified the birds by comparatively larger size than other white egrets present, the long “kinked” s-shaped neck, large yellow bill and black legs and feet. Other white egrets present in the area were Cattle Egrets *Bubulcus ibis* (40+ individuals), Intermediate Egret *Egretta intermedia* (8), and Little Egret *Egretta garzetta* (8). Great Egrets were previously recorded from Batan, Cebu, Luzon, Mactan, Mindanao, Mindoro, Negros and Palawan.

LITTLE HERON *Butorides striatus amurensis*

Specimen record, 1 female (CMNH 36900) moulting into adult plumage, caught by NMP/CMNH PBI Team in a mist net, 29 April 1992 at 125 m along the Bacong River in the Alojipan DENR Nursery, with ovary measuring 12 x 6 mm and diameter of largest ovum 1.5 mm. We compared this specimen to a specimen (DMNH) of the resident subspecies *carcinophilus* and, based on its longer wing (190 vs 169 mm), culmen (78.4 vs 65.9 mm) and tarsus (52.9 vs 43.9 mm) and greener upperparts, identified it as representing the migrant subspecies *amurensis*, previously known in the Philippines from Calayan, Cebu, Luzon, Mindanao, Mindoro, Negros and Samar. This is the first record of this subspecies from Panay.

ORIENTAL HONEYBUZZARD *Pernis ptilorhynchus philippensis*

Kennedy and Ebreo observed 2 on 13 October at c. 1,000 m, 1 on 14 October at c. 1,500 m, and 1 on 15 October 1989 at c. 1,200 m, all on Mt Baloy along the trail linking Camps 1 to 3, soaring at various heights over the mid-mountain and montane mossy forest. They clearly saw the long “chicken-like” neck, long slender wings with translucent windows, long tail and pale rufous underparts of these birds. By the streaking on the breast and pattern of the banding on the tail, they identified at least one of these birds as representing the endemic subspecies *P.p. philippensis* previously recorded from Basilan, Biliran (Kennedy *et al.* in press), Catanduanes, Cebu, Luzon, Mindanao, Mindoro, and Negros, and presumably this race on Leyte and Samar.

BESRA *Accipiter virgatus confusus*

Specimen records 4, all caught in mist nets inside forest by the NMP/CMNH PBI Team: 1 male (NMP 16734) netted 9 October 1989 at 1,530 m in montane mossy forest on Mt Baloy, Camp 2 with partially developed testes (6 x 5 mm); 1 adult male (CMNH 36752) collected 10 April 1992 at 1,137 m in mid-mountain forest at Hanggud Tubig, Mt Madja-as with undeveloped testes; 1 immature female (CMNH 36902) on 28 April 1992 at 95 m at the Alojipan DENR Nursery with ovary measuring 9 x 5 mm and diameter of largest ovum 1.5 mm, suggesting it was beginning to breed; 1 adult male (NMP 18976) on 2 May at 120 m at the Alojipan DENR Nursery with testes slightly enlarged measuring 6 x 3 mm.

Based on the barring of the underparts of the adult males we have identified these birds as representing the Philippine endemic subspecies *A. v. confusus* previously recorded from Catanduanes, Luzon, Mindoro and Negros. Brooks & Dutson (1997) reported an unidentified *Accipiter* from Panay that was probably this species.

CHINESE GOSHAWK *Accipiter soloensis*

Specimen records 2, both moulting into adult plumage, and mist-netted by the NMP/CMNH PBI Team inside the mid-mountain forest at Hanggud Tubig, Mt Madja-as: 1 female (CMNH 36821) on 8 April 1992 at 1,100 m with ovary slightly enlarged measuring 9 x 5 mm; and 1 female (NMP 18896) on 10 April 1992 between 990 and 1,350 m, with ovary slightly enlarged measuring 10 x 5 mm.

This species is a fairly common migrant to the Philippines with records scattered throughout the archipelago.

PEREGRINE FALCON *Falco peregrinus ernesti*

On 28 February 1993, Kennedy and Ebreo saw an immature very dark Peregrine fly low over (10 to 15 m above ground) the fish ponds at Barotac Nuevo. It flew over their heads and maintained speed and altitude flying essentially in a straight line until it disappeared several km away.

They identified this extremely dark individual as a representative of the resident subspecies *F. p. ernesti*, recorded in the Philippines from Calayan in the north to Tawi-Tawi (Hornskov 1996) in the south.

BAILLON'S CRAKE *Porzana pusilla pusilla*

Specimen records 4, all obtained at 5 to 10 m elevation in May 1976 from Zarraga, Iloilo Province: 1 immature female (DMNH 55808); 1 adult female (DMNH 55809); and 2 adult males (DMNH 55810, 55811). From the hand writing on the label they appear to have been collected by Nicandro Icarangal, Sr. Baillon's Crake is considered uncommon in the Philippines with previous records from Dinagat, Luzon, Marinduque, Negros and Palawan.

COMMON REDSHANK *Tringa totanus eurhinus*

Kennedy and Ebreo saw 2 individuals from 25 to 100 m away foraging in and flying over shallow fish ponds at Barotac Nuevo, 28 February 1993 in mid afternoon. They clearly saw key field marks of these winter-plumaged birds including reddish orange legs, straight dark bill with orange red base, white rump and wedge up back, and diagnostic white trailing edge to wing. Several other shorebird species were also in the area (see following accounts) but generally there were not many individuals of any species present.

The Common Redshank is a common migrant to the Philippines with records scattered throughout the archipelago.

MARSH SANDPIPER *Tringa stagnatilis*

On 28 February 1993 in mid afternoon, Kennedy and Ebreo saw 6 individuals from 15 to 100 m away, feeding in and flying over the fish ponds at Barotac Nuevo. The birds foraged in small groups in the shallow water up to their bellies. They identified the birds by their foraging behaviour, slender bills and overall body proportions, white eyebrows and underparts and greyish upperparts. The larger Common Greenshank was nearby for comparison.

Marsh Sandpipers are uncommon migrants to the Philippines with prior records from Cebu, Luzon, Mindanao, Negros, Olango (Anon 1993) and Palawan.

COMMON GREENSHANK *Tringa nebularia*

A single bird in non-breeding plumage was seen foraging and flying from 25 to 100 m away by Kennedy and Ebreo at the fish ponds at Barotac Nuevo on 28 February 1993. The individual was flushed several times to confirm its white rump and wedge going up the back, and its fairly plain, unbarred wings. This species is an uncommon to common migrant to the Philippines with scattered records throughout the islands.

RUDDY TURNSTONE *Arenaria interpres*

Kennedy and Ebreo saw 2 individuals of this distinctive boldly patterned species from 25 to 50 m away foraging at the edge of the fish ponds at Barotac Nuevo in mid afternoon on 28 February 1993. A common migrant with scattered records throughout the Philippines.

LONG-TOED STINT *Calidris subminuta*

A minimum of 8 individuals were observed by Kennedy and Ebreo at the fish ponds at Barotac Nuevo on 28 February 1993. The birds were identified at a distance of about 15 m, close enough to see their distinctive yellowish legs, strongly mottled upperparts and greyish-brown breast bands. Long-toed Stints are common migrants to the Philippines with scattered records throughout, including Palawan.

CURLEW SANDPIPER *Calidris ferruginea*

Kennedy and Ebreo saw 2 individuals in winter plumage, 20 to 50 m away, foraging and flying at the fish ponds at Barotac Nuevo on 28 February 1993. Key field marks noted were long decurved black bill, relatively short black legs, fairly uniform greyish brown upperparts with white rump and narrow white wing bar. An uncommon migrant, Curlew Sandpipers previously have been recorded on Cebu, Luzon, Mindoro, Negros, Olango (Magsalay *et al.* 1989), Palawan and Simunul.

YELLOW-BREASTED FRUIT-DOVE *Ptilinopus occipitalis occipitalis*

Specimen records 2: 1 adult female (NMP 16361) obtained by Sison and Pelayo on Mt Baloy on 17 February 1987; 1 immature female (CMNH 36753) mist-netted on 6 April 1992 by the NMP/CMNH PBI team at 1,044 m at Hanggud Tubig, Mt Madja-as. Considering this species is frequently caught in mist nets and that only 2 specimens were obtained, we suspect that this Philippine endemic is rare or at best uncommon on Panay.

The Yellow-breasted Fruit-Dove, subspecies *P. o. occipitalis*, was previously known from neighbouring Negros, and from major islands north and east of Panay.

REDDISH CUCKOO-DOVE *Macropygia phasianella tenuirostris*

Specimen records 13 (6 CMNH, 7 NMP), all caught in mist nets from 5 to 24 April 1992 at Hanggud Tubig (5 males, 5 females) and Nalanaw (1 male, 2 females) on Mt Madja-as. All specimens were in breeding condition with enlarged gonads, testes ranged from 11 x 6 to 16 x 8 mm, and ovaries from 10 x 6 to 13 x 9 mm all with developing ova. Of the 13 birds, 11 were evenly distributed in mid-mountain forest from 1,075 m to 1,347 m. The remaining 2 were obtained at 1,480 m and 1,525 m. The Reddish Cuckoo-Dove was a common resident on Mt Madja-as but strangely was not recorded on Mt Baloy. The endemic subspecies *M. p. tenuirostris* has been recorded throughout the Philippines, except the northern Babuyan and Batan Islands.

SPOTTED DOVE *Streptopelia chinensis tigrina*

Kennedy and Ebreo saw 5 individuals on 30 September 1989 and 2 on 12 October 1989 as the birds were foraging on the ground in the wide Cadian River floodplains east of Valderrama. They identified the birds by their medium size, long tails with white tips to outer tail feathers, and by the diagnostic broad black collar with white spots. This resident has been expanding its range throughout the Philippines, particularly in cultivated areas (Dickinson *et al.* 1991).

HODGSON'S HAWK-CUCKOO *Cuculus fugax pectoralis*

Specimen record, 1 male (CMNH 36759) mist-netted by the NMP/CMNH PBI Team on 6 April 1992 at 1,042 m in mid-mountain forest at Hanggud Tubig, Mt Madja-as; testes partially enlarged (5.5 x 3 mm). This is the first record of the widely distributed Philippine endemic subspecies *C. f. pectoralis* from Panay, where it appears to be uncommon.

ORIENTAL CUCKOO *Cuculus saturatus horsfieldi*

Specimen records 3, all mist-netted: 1 hepatic female (CMNH 36760) obtained on 8 April 1992 at Hanggud Tubig, Mt Madja-as in mid-mountain forest at 1,115 m; and 2 adult females mist-netted by the NMP/CMNH PBI Team on 28 April (CMNH 36910) at 120 m and 30 April 1992 (NMP 18977) at 90 m, both at the Alojipan DENR Nursery. This widespread migrant to the Philippines appears to be uncommon on Panay.

PHILIPPINE SCOPS-OWL *Otus megalotis nigrorum*

Specimen records 8, all but 1 mist-netted: 1 male (NMP 16310) and 1 female (NMP 16311) caught by Sison and Pelayo on 13 February 1987 at c. 1,000 m on Mt Baloy; 1 female (CMNH 34172) collected by NMP/CMNH PBI Team on 17 October 1989 in mid-mountain forest at 950 m on Mt Baloy, Camp 2, with slightly enlarged ovary (9.0 x 4.5 mm) and oviduct, and largest ovum 1 x 1 mm. Remaining birds (3 males, 2 females) were obtained by the NMP/CMNH PBI Team from Mt Madja-as from 10 to 28 April 1992, 4 from Hanggud Tubig at elevations from 1,000 to 1,044 m, and 1 from Alojipan DENR Nursery at 100 m. All Mt Madja-as birds had enlarged gonads, with testes ranging from 10 x 6 to 19 x 12 mm, and ovaries around 11 x 6 mm with enlarged ova and the presence of 3 or 4 corpora lutea.

The subspecies *O. m. nigrorum*, now known from Negros and Panay, may well prove to be a distinct species. The status of this and other subspecies of *Otus megalotis* is currently under study by Miranda and Kennedy, using both morphometric and mitochondrial DNA methods.

PHILIPPINE SWIFTLET *Collocalia mearnsi*

Specimen records 8 (NMP 18942 to 18945, CMNH 36848 to 36851), all obtained by the NMP/CMNH PBI Team from Nalanaw, Mt Madja-as from 19 to 23 April 1992 at altitudes from 1,370 to 1,570 m. Of 6 females, 5 had relatively small ovaries, but one had a developed ovum in the oviduct. Testes of the 2 males were moderately enlarged, measuring 4 x 3 and 4 x 2 mm. Brooks & Dutson (1997) tentatively identified this species on Mt Madja-as in 1994. The specimens reported here, obtained before their sightings, confirm the presence of this Philippine endemic on Panay. Previously, it was known from Bohol, Camiguin Sur, Cebu, Luzon, Mindanao, Mindoro, Negros and Palawan.

ASIAN PALM SWIFT *Cypsiurus balasiensis pallidior*

Kennedy and Ebreo saw c. 10 birds, scattered along the National Highway from Iloilo City to Valderrama, Antique Province on 30 September 1989. Each bird was identified by its habit of flying low over coconut plantations or nearby clearings, its small size, long slender wings, long deeply forked tail and dark rump. The subspecies *C. b. pallidior* is endemic to the Philippines, excluding the Palawan Group. On Panay and on the other islands where it has been recorded, it is generally common in the lowlands.

SPOTTED WOOD-KINGFISHER *Actenoides lindsayi moseleyi*

Specimen records 7, all mist-netted in forest or forest patches: 1 (NMP 16315) collected by Sison and Pelayo on 22 February 1987 at c.1,000 m on Mt Baloy; 1 male (CMNH 34195) collected 4 October 1989 at 210 m on Mt Baloy, Camp 1; 1 male (NMP 16733) on 16 October 1989 at 975 m from Mt Baloy, Camp 2. Gonads of the October 1989, Mt Baloy birds were small (3 x 1 mm) indicating they were not breeding. The remaining 4 specimens are from Mt Madja-as: 2 males (CMNH 36768, NMP 18906) and 1 female (NMP 18907) collected between 6 and 8 April 1992 from 1,006 to 1,185 m from Hanggud Tubig; and 1 male (CMNH 36913) on 29 April 1992 at 108 m from Alojipan DENR Nursery. All April Mt Madja-as birds had enlarged gonads, testes ranging from 5 x 4 to 6.5 x 5 mm, and ovary 10 x 8 mm with 3 corpora lutea present and diameter of largest ovum 1.5 mm.

We compared the Panay specimens of this Philippine endemic to specimens (FMNH, CMNH) of *A. l. moseleyi* from Negros and found no differences between them that could not be explained by individual variation. This species appears to be uncommon to fairly common on Panay.

FLAME-TEMPLED BABBLER *Stachyris speciosa* subsp.

Specimen records 4, obtained by Sison and Pelayo: 1 male (NMP 16320) with partially enlarged testes collected 25 February 1987 at 1,000 m on Mt Baloy; 1 male (NMP 16364) collected on 9 March 1987 with enlarged testes, 1 male (NMP 16371) with partially enlarged testes, and 1 female (NMP 16370) both collected 10 March 1987 with these 3 specimens from Jamindan, Municipality of Libacao, Aklan Province. This Philippine endemic was formerly only known with certainty from Negros. These Panay records confirm Bourns and Worcester's statement in McGregor (1909-10) that they were "quite confident" that they had seen this species once on Panay.

We have compared Panay and Negros specimens (DMNH, FMNH) and have found some differences between them, but we defer judgement on the taxonomic status of the Panay birds until we have looked at additional specimens from Negros.

WHITE-BROWED SHORTWING *Brachypteryx montana* subsp.

Specimen records 93 (40 NMP, 42 CMNH, 11 not designated). We found this species to be a common resident in the mid-mountain to montane mossy forest of Panay. Between 16 February and 7 March 1987, Sison and Pelayo obtained the first 6 specimens at c.1,000 m from Mt Baloy. Only 1 of the 5 males and 1 female they collected had enlarged gonads.

During the NMP/CMNH PBI survey of Mt Baloy from 1 to 17 October 1989, this species was obtained (n=29) only from Camp 2 between 1,430 and 1,530 m but was heard by Kennedy, Gonzales and Ebreo up to the peak of Mt Baloy at 1,910 m. No shortwings were captured at Mt Baloy, Camp 3 that covered altitudes from 770 to 975 m. At Camp 3 the shortwing had apparently been replaced by the behaviourally similar White-browed Shama *Copsychus luzoniensis*, as 6 individuals of this species were captured there. Of 13 males sexed, 7 were in breeding condition with testis size

ranging from 6 x 4 to 7 x 5 mm. The remaining birds had small testes and, in nearly all cases, skull ossification indicated that they were immature. Of 8 females, 4 had developed ovaries ranging from 7 x 4 to 11 x 5 mm.

On the Mt Madja-as survey from 4 to 26 April 1992, we obtained a large series of specimens (n=58) from Hanggud Tubig and Nalanaw. They ranged from 996 to 1,555 m elevation with 37 obtained from 39 mist nets (capture/mist net ratio = 0.95) from 1,350 to 1,570 m, while 17 were obtained from 50 mist nets (capture/mist net ratio = 0.34) from 996 to 1,349 m. Of 25 males sexed, 22 had enlarged testes ranging from 5.5 x 3 to 8 x 5 mm, 2 had slightly enlarged testes 2 x 2 to 3 x 2 mm, and 1, a juvenile, had small testes 1 x 1 mm. Of 18 females sexed, 16 had enlarged ovaries ranging from 6 x 3 to 10 x 6 mm, and of these one had a shelled egg in its oviduct. The remaining 2 females were juveniles.

The White-browed Shortwing is widespread and common in the Philippines and 7 endemic subspecies are currently known. The Panay population is also common but we have yet to determine whether it is an undescribed subspecies or whether it belongs with neighboring *B. m. brunneiceps* from Negros, or with some other subspecies.

SIBERIAN RUBYTHROAT *Luscinia calliope*

Specimen record, 1 female (CMNH 36864) mist-netted by the NMP/CMNH PBI Team on 22 April 1992 at 1,330 m in montane forest at Nalanaw, Mt Madja-as. This individual contained heavy fat. This migrant appears to be a rare winter visitor to Panay, as it is throughout the Philippines.

SUNDA GROUND-THRUSH *Zoothera andromedae*

Specimen records 5, all obtained from Camp 2 on Mt Baloy at 1,530 m in montane mossy forest, 7 to 8 October 1989, including 1 adult female (NMP 16726) with enlarged ovary measuring 11 x 7 mm, 3 nestlings (CMNH 34250 to 34252) a few days old, and 1 juvenile female (CMNH 34249) with undeveloped ovary (6 x 4 mm) and unossified skull. The nest containing the nestlings and from which the adult female was captured was bowl-shaped and located 4.6 m from the ground in the fork of a medium-sized tree; the diameter of the main trunk below the nest was 17.6 cm. The nest had the following measurements in mm: overall length 210, width 185, and height 85; nest bowl length 125, width 70 and depth 50. It was made of mosses and rootlets and the bowl was lined with hairlike rootlets. This is the first record of a nest of this species from the Philippines. Also, this may well be the first description of the nest of this species, as we have not been able to locate a description elsewhere.

This secretive montane mossy forest bird has been recorded in the Philippines previously only from Luzon, Mindanao, Mindoro and Negros.

ISLAND THRUSH *Turdus poliocephalus* subsp.

Specimen records 28 (12 NMP, 14 CMNH, 2 not designated) all mist-netted in mid-mountain to montane mossy forest on Mt Baloy and Mt Madja-as. We captured 5

specimens at Camp 2 on Mt Baloy between 7 and 13 October 1989 at elevations ranging from 1,530 to 1,540 m. Kennedy and Ebreo saw many individuals on the higher slopes of Mt Baloy from Camp 2 to the peak at 1,910 m. We did not see or obtain any specimens at Camp 3, which apparently was below the altitudinal range of this species on Mt Baloy. Of 4 specimens sexed, 3 were females all with relatively undeveloped ovaries measuring from 9 x 4 to 11 x 5 mm, and 1 was a male with relatively small testes measuring 3 x 3 mm.

On Mt Madja-as, specimens were collected at both Hanggud Tubig (n=4) and Nalanaw (n=18) from 6 to 25 April. Only 4 specimens were captured in 66 mist nets (capture/mist net ratio = 0.06) below 1,400 m, 1 at 1,100 m, 1 at 1,223 m, 1 at 1,330 m, and 1 at 1,344 m. Of the 19 remaining specimens, 18 were caught using 23 mist nets (capture/mist net ratio = 0.78) above 1,400 m, indicating their strong preference for montane mossy forest.

The population was breeding during the census period with 10 males showing enlarged testes ranging from 10 x 7.5 to 15 x 10 mm, and 8 females having enlarged ova or corpora lutea present in their ovaries, which ranged from 9.5 x 6 to 25 x 15 mm. One female had 3 eggs of various stages of development in her oviduct, while 1 male and 1 female, both juveniles, had small gonads.

The Island Thrush is found commonly in montane forest from Luzon to Mindanao, but it has not been found on Palawan. Seven endemic subspecies have been described. The Panay population clearly represents a new subspecies that we shall describe elsewhere.

EYEBROWED THRUSH *Turdus obscurus*

Specimen records, 3 males (NMP 18925, CMNH 36788, 36789), all mist-netted at Hanggud Tubig, Mt Madja-as between 8 and 11 April 1992 at 1,040 to 1,329 m elevation. This winter migrant has been recorded from Luzon to Mindanao and Palawan and usually occurs in forest edge in small to large flocks.

MOUNTAIN LEAF-WARBLER *Phylloscopus trivirgatus nigrorum*

Specimen records 58 (25 NMP, 24 CMNH, 9 not designated) all mist-netted from mid-mountain to montane mossy forest on Mt Baloy and Mt Madja-as. From 21 February to 6 March 1987 Sison and Pelayo obtained the first 3 specimens (NMP 16316, 16357, 16359) at c. 1,000 m from Mt Baloy.

During the 1989 survey of Mt Baloy, we obtained 12 specimens from 7 to 13 October, only from Camp 2 at c. 1,530 m elevation. Like the White-browed Shortwing and Island Thrush, no Mountain Leaf-Warblers were captured on the lower slopes between 770 and 975 m at Camp 3, but they were seen above Camp 2 to the peak of Mt Baloy at 1,910 m. Only 1 of 9 males was in breeding condition with testes slightly enlarged (4.0 x 1.0 mm). None of the 3 females appeared to be in breeding condition.

On Mt Madja-as from 5 to 26 April 1992, we mist-netted 43 birds at Hanggud Tubig and Nalanaw between 1,050 and 1,500 m with only 1 bird captured below 1,100 m. Birds were fairly evenly distributed above 1,100 m with 17 captured in 29 nets

(capture/mist net ratio = 0.59) between 1,100 and 1,349 m and 25 captured in 39 nets (capture/mist net ratio = 0.64) between 1,350 and 1,570 m. Of 16 males sexed, 15 had enlarged testes ranging from 3 x 2 to 7 x 5 mm, the other was a juvenile with no skull ossification. Of 8 females, 6 appeared to be in breeding condition with ovaries measuring 5 x 3 to 7 x 6 mm, while 2 had small ovaries measuring 4 x 3.

We compared the plumage of the Panay birds with that of a series (n=8, CMNH, NMP) from Mt Kanla-on on Negros and concluded that, aside from individual variation, both populations are the same and belong to *P. t. nigrorum*.

WHITE-THROATED JUNGLE-FLYCATCHER *Rhinomyias albigularis*

Specimen records 7, 6 mist-netted, 1 caught in a mammal snap trap: 2 males (NMP 18939, CMNH 34265) on 3 October 1989 at Camp 1, Mt Baloy at 210 m, both with small testes measuring 3 x 1 mm; 1 female (NMP 16700) on 15 October 1989, and 1 female (CMNH 34266) on 16 October, both at Camp 3, Mt Baloy at 950 m, with undeveloped ovaries and skull ossification from 50 to 75%; 2 males on 8 April 1992 at Haggud Tubig, Mt Madja-as at about 1,000 m, 1 (CMNH 36798) with slightly enlarged testes measuring 3 x 3 mm and 1 male (NMP 18930) with enlarged testes measuring 12 x 6 mm; and 1 male (CMNH 36930) on 28 April 1992 from the Alojipan DENR Nursery at 80 m with enlarged testes measuring 9.5 x 4.5 mm. We have compared these 7 specimens with 2 males, 2 females (FMNH) from Negros and found only individual and overlapping differences in plumage and measurements among the birds from the two islands. This Philippine endemic was previously known only from Negros and Guimaras, and appears to be uncommon on Panay in lowland to middle elevation forest and patches of forest.

FERRUGINOUS FLYCATCHER *Muscicapa ferruginea*

Specimen record, 1 immature male (NMP 16693) with spotted crown, mist-netted in montane mossy forest at Camp 2 on Mt Baloy at 1,530 m on 13 October 1989. This rare migrant has previously been recorded in the Philippines only from Luzon, Mindoro, Palawan and Sibutu.

SNOWY-BROWED FLYCATCHER *Ficedula hyperythra* subsp.

Specimen records 56 (30 NMP, 22 CMNH, 4 not designated) all mist-netted in mid-mountain to montane mossy forest. Sison and Pelayo obtained 11 (8 males, 3 females) specimens from 17 February to 5 March 1987, all from c. 1,000 m on Mt Baloy. The birds were generally not in breeding condition yet 3 males had slightly developed testes judging from drawings on the labels.

On Mt Baloy in 1989, we obtained 12 specimens from 7 to 16 October, 8 at 1,530 m from Camp 2, and 4 at 950 m from Camp 3. Of 10 birds sexed, none was in breeding condition.

During the 1992 survey of Mt Madja-as, we obtained 33 specimens (2 with no altitudinal data) from 5 to 25 April with an altitudinal range from 1,095 to 1,570 m. We found that they were unevenly distributed within this range with 16 captured in 21

mist nets (capture/mist net ratio = 0.76) between 1,095 and 1,223 m and 15 captured in 39 mist nets (capture/mist net ratio = 0.38) between 1,352 and 1,570 m. None was captured in 11 mist nets between 1,240 and 1,350 m. Of 22 birds sexed, 15 were males all with enlarged testes ranging from 5 x 3 to 8 x 4.5 mm, and 7 were females with ovaries ranging from 5 x 3 to 7 x 4 mm. Despite the relatively small size of the ovaries, the birds were apparently in breeding condition as one ovary contained 2 corpora lutea and a slightly enlarged ovum measuring 2 x 2 mm.

Snowy-breasted Flycatchers are widespread and common in mid-mountain and montane forests throughout the Philippines and 8 endemic subspecies have been described. We have yet to determine the subspecific status of the Panay population.

PECHORA PIPIT *Anthus gustavi gustavi*

Specimen records 5, all mist-netted: 2 males in 1989 at Camp 3, Mt Baloy from 950 to 975 m elevation in mid-mountain forest on 16 (NMP 18940) and 17 (CMNH 34287) October; and 3 males in 1992 from the Alojipan DENR Nursery in the foothills of Mt Madja-as from 80 to 95 m elevation on 28 April (NMP 18978, CMNH 36935) and 1 May (CMNH 36936).

The Pechora Pipit is an uncommon migrant throughout most of the Philippines, including Panay.

FIRE-BREASTED FLOWERPECKER *Dicaeum ignipectus* subsp.

Specimen record, 1 male (CMNH 36815) in breeding condition with testes measuring 5 x 4 mm, mist-netted at Hanggud Tubig, Mt Madja-as in mid-mountain forest at 1,137 m on 8 April 1992. This species appears to be uncommon to rare in the mountains of western Panay.

Three endemic subspecies of the Fire-breasted Flowerpecker are known in the Philippines, patchily recorded from montane forests of Luzon, Samar, Mindanao and Negros. We have yet to determine the subspecific status of this specimen, but suspect it will be similar to the subspecies *D. i. apo*, from Negros.

MOUNTAIN WHITE-EYE *Zosterops montanus* subsp.

Specimen records 24 (11 NMP, 13 CMNH) all mist-netted in mid-mountain to montane mossy forest. Sison and Pelayo obtained the first specimen, a female (NMP 16330) on Mt Baloy on 13 February 1987 at c. 1,000 m elevation. The NMP/CMNH Biodiversity Team did not obtain any specimens on Mt Baloy in 1989 but Kennedy and Ebreo saw them in small flocks or mixed flocks in the canopy of montane mossy forest at Camp 2 from 1,430 m to the peak of Mt Baloy at 1,910 m.

On Mt Madja-as, we obtained 23 specimens between 5 and 25 April 1992 from both Hanggud Tubig and Nalanaw. Aside from 10 birds caught between 1,100 and 1,137 m, they were fairly evenly distributed in elevation from 1,000 to 1,430 m, but none was caught in the 14 nets above this elevation. These birds tend to be more canopy oriented, particularly in mossy forest, and this may explain why we did not catch them on Mt Baloy or on the higher slopes of Mt Madja-as. Of 17 birds sexed on

Mt Madja-as, 10 were males in breeding condition with gonads measuring from 6 x 5 to 8 x 6 mm, and 7 were females, 4 adults with gonads measuring 5 x 3 to 6.5 x 5 mm (the largest with 1 corpus luteum and largest ovum 1.5 mm) and 3 juveniles with gonads measuring 2 x 1 to 5 x 4 mm and skull ossification 70% or less.

The Mountain White-eye is a common resident in the mid-mountain and montane forests of Panay. We have compared the plumage of the Panay population to 8 specimens (CMNH) of *Z. m. pectoralis* from Negros and 3 specimens (CMNH) of *Z. m. halconensis* from Mindoro. The taxonomic status of the Panay population is uncertain as they do not appear to belong to either of the above subspecies. This problem will be addressed in a future paper.

TAWNY-BREASTED PARROTFINCH *Erythrura hyperythra brunneiventris*

Specimen record, 1 male (CMNH 36820) in breeding condition with testes measuring 4 x 4 mm, mist-netted at Hanggud Tubig, Mt Madja-as in montane forest at 1,245 m on 8 April 1992. Previously recorded in the Philippines only from Luzon and Mindoro, this species appears to be rare in the mountains of western Panay.

WHITE-CHEEKED BULLFINCH *Pyrrhula leucogenis* subsp.

Specimen record, 1 male (CMNH 36899) with moderately enlarged testes measuring 3 x 2.5 mm, mist-netted at Nalanaw, Mt Madja-as in montane mossy forest at 1,392 m on 21 April 1992. This unique specimen differs in several ways from the other known subspecies of this endemic Philippine species from Luzon (*P. l. leucogenis*) and from Mindanao (*P. l. steerei*). The presence of this species on Panay adds credence to a record (questioned and not accepted by Dickinson *et al.* 1991) of an immature specimen (AMNH 714669) reported to be from Mindoro.

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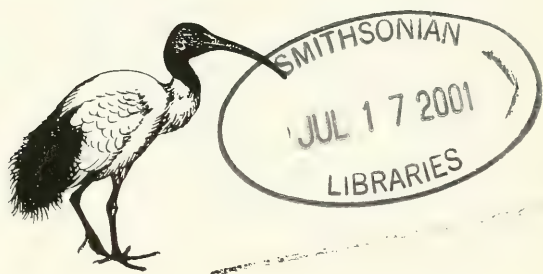
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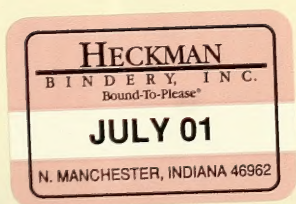
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CORRECTIONS TO TEXT

Page	31	line	36	<i>Pogoniulus</i> not <i>Poponioulus</i>
"	"	"	37	<i>Anthreptes</i> not <i>Athreptes</i>
"	143	"	25	<i>Allectroenas</i> not <i>Alecroeanas</i>
"	178	"	11	<i>olivaceus</i> not <i>olivaceous</i>
"	245	"	13	<i>Orchesticus</i> not <i>Orchestiscus</i>
"	248	"	22	<i>Ramphocelus</i> not <i>Rhamphocelus</i>



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